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24th Annual Meeting of the ESVCE

Berlin, 2018



Berlin, Germany
27th - 29th September 2018

Proceedings of the First Annual Meeting

of the European Congress of Behavioural Medicine and Animal Welfare (ECVBM/W)



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Proceedings of the
**FIRST ANNUAL MEETING OF THE
EUROPEAN CONGRESS OF
BEHAVIOURAL MEDICINE AND
ANIMAL WELFARE (ECVBMVA)**

Berlin, Germany
27th - 29th September 2018

In association with

24th Annual Meeting of the European Society of Veterinary Clinical Ethology (ESVCE)

8th Annual Meeting of the European College of Animal Welfare and Behavioural Medicine (ECAWBM)

4th Annual Meeting of the Animal Welfare Science, Ethics and Law Veterinary Association
26th Annual Meeting of the GTVMT (GTVMT)



Bitte beachten Sie

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Edited by

Barbara Schöning, Valerie Jonckher-Sheehy, David Morton,
Paul Roger, Tomas Camps

Welcome to Berlin!

In 2010 we had the 16th Congress of the European Society of Veterinary Clinical Ethology (ESVCE) and the 7th Meeting of the then European College of Veterinary Behavioural Medicine (ECVBM-CA) in Hamburg, Germany. This conference was a big success with about 150 attendees. Since then a lot has changed within the organisations. The college has become the European College of Animal Welfare and Behavioural Medicine (ECAWBM) and since 2015 the Animal Welfare Science, Ethics and Law Veterinary Association (AWSELVA) has joined in as organizing partner for the conference.

So from 1994, when the first ESVCE-Conference took place in Amsterdam, Netherlands (as a one day satellite meeting to Voorjaarsdagen) veterinary behavioural medicine and clinical ethology has seen a tremendous upswing and development to a recognisable medical science. Consequently, as a behaviour problem is in most of the cases also a welfare problem, now a welfare organisation has joined in with the conference to allow even more focus on animal welfare.

For our national German Association of behavioural medicine and therapy (GTVMT) its now a pleasure to have our annual meeting a second time together with ESVCE, and together with ECAWBM and AWSELVA. This 26th meeting of GTVMT, 24th congress of ESVCE, 14th congress of ECAWBM and 4th congress of AWSELVA promises to give an overview about the state of the art in the field. Looking at Amsterdam is like looking back in time; looking at this year's program is a promise for the future.

Organizing such an event is not easy and I would like to thank all those who helped, either through practical work or through emotional back-up. I thank especially our sponsors as without money such a congress would not be possible.

My thanks go to all board members from the different groups for the dedicated work and the friendly and humorous atmosphere.

So many delegates found their way to Berlin, from so many different countries - for learning, sharing, discussions, meeting old friends, finding new ones. So finally I would like to thank you as delegate: with your participation you make this meeting an event.

I wish you an interesting and pleasant stay in Berlin and hope you will enjoy the congress.

Barbara Schöning
GTVMT President and ESVCE President

Welcome to Berlin

AWSELVA is pleased to welcome you all to this excellent conference as a partner with ECAWBM, ESVCE and GTVMT.

This conference marks an opportunity for both sub-specialities to share developments and interests across the wide arena of the specialisms we each bring to this exciting mix.

We have the opportunity to engage more fully as a united College in driving change and development of not only the training for our future specialists but also in aiding policy decisions nationally and within the EU and beyond shaping these decisions on an increasingly complex evidence base and ensuring that due recognition is given to the expertise we bring to these areas.

These are exciting times with global links needed with our sibling organisations from different continents sharing our approaches and our goals.

The more involved our memberships become, the stronger our voice will be and so we look forward to greeting you all to Berlin in September

We are grateful to our sponsors and to all registrants for their participation in what looks to be a very memorable conference and a special vote of thanks to our hard working local organisers and hosts.

Thank you GTVMT - great to see such a good number of delegates spanning all interests and ages.

Best wishes

Paul Roger
AWSELVA chair

Dear colleagues and friends,

ECAWBM, the European College of Animal Welfare and Behavioural Medicine, is very happy to welcome you to our annual congress, held together with AWSELVA, ESVCE and GTVMT. Since the College was created, the annual congress has been identified as crucial moment and a need. Our special words of thank go to GTVMT Board, not only for accepting receiving all of us in Berlin, but also for the hard work organizing this Congress.

We are very thankful to our Germany hosts for providing us with an outstanding organization and scientific programme, with researchers from all over Europe and beyond. This Congress offers us the opportunity to listen to colleagues who are dedicated to high quality research and gives us access to their observations and results. Nevertheless, there is no scientific congress without an organizing and a scientific committee. Our congress is benefiting, year after year, from a hard work of wonderful and highly professional people in both committees. On the behalf of ECAWBM I would like to thank to the Scientific Committee, from General Secretary, Academic Secretaries, Reviewers to Editors, for their dedication to our specialities.

Three days of lectures, ECAWBM Study Days and ESVCE Workshop, will be complemented by an entertaining social programme placed in a comfortable and casual environment. We hope that, after fulfilling lectures close to your heart, you still have the energy to attend the social events to catch up with colleagues, friends and business partners.

Last but not the least, the final words go to the sponsors, without whom this Congress would not be possible! Many thanks for supporting our specialisation field and trusting in our work! I encourage everyone to visit the sponsors' stands in the commercial exhibition during the congress, where you can find news and can talk directly with each representative members.

Welcome and we hope you enjoy the Congress and your stay in Berlin!

Yours sincerely,
Gonçalo da Graça Pereira
ECAWBM President

**Thursday, 27th September 2018 –
Animal Welfare Science, Ethics and Law Day**

Ethics

1	Ethical committees in animal research: law boundaries and beyond CARLOS GRAU PARICIO	09:00
3	Consent in companion animal veterinary practice ANNE FAWCETT	09:15
5	Animal Experimentation: Working Towards a Paradigm Change KATHRIN HERRMANN	09:30
10	Veterinary students' own interests in welfare and ethics ANDREW GARDINER	09:45
12	An ethical analysis of the evolution of zoos in the light of human conception of captivity JULIE GAILLARD, D. REMY	10:00
16	The British animal health and welfare policy process: accounting for the interests of sentient species STEVEN P. McCULLOCH	10:15
Coffee and Poster Presentations		10:30

TIMETABLE

18	The application of David Fraser's Practical Ethic in veterinary practice ANNE FAWCETT	11:00
20	The case for putting ethics back into policy making: A proposal for a UK Ethics Council for Animal Policy STEVEN P. McCULLOCH	11:15
22	Dog welfare, ethics and evidence based veterinary medicine: special focus on veterinary behavioural medicine VALERIE JONCKHEER- SHEEHY ET AL.	11:30
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Pain and Emotional State		
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25	Towards a more accurate evaluation of acute pain: does standardised training of assessors improve the inter-observer reliability of the Horse Grimace Scale (HGS)? EMANUELA DALLA COSTA ET AL.	11:45
27	Effect of fluralaner on behavioural and stress indicators in laying hens infested with Dermanyssus gallinae DEBORAH TEMPLE ET AL.	12:00
29	Tail and ear movements as potential feasible indicators of emotions in pigs MIRIAM MARCET RIUS ET AL.	12:15
31	Nociceptive threshold of goat kids undergoing injection of clove oil or isoeugenol for disbudding – a preliminary study SUSANNE WAIBLINGER ET AL.	12:30

TIMETABLE

33	Behavioural and patho-physiological response as possible signs of pain in dairy cows during Escherichia coli mastitis: A pilot study ALICE DE BOYER DE ROCHES ET AL.	12:45
36	To disbud but not to dock – is that our answer? ANNA VALROS, M.S. HERSKIN	13:00
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Lunch / AWSELVA OMG		13:15
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Welfare at Slaughter		
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38	EEG and Behavioural Changes for on-farm euthanasia of turkeys ELEIN HERNANDEZ ET AL.	15:00
40	Attitudes of slaughter industry personnel towards animal welfare ELLIE WIGHAM ET AL.	15:15
42	Pre-slaughter cattle handling and stress in mobile slaughter JAN HULTGREN ET AL.	15:30
44	Welfare “triage” of broilers to find and counteract suffering JOHN CRANLEY	15:45
46	An observational study on tail biting in commercial Greek slaughterhouse EVANGELIA SOSSIDOU ET AL.	16:00
48	Housing conditions influence perception of auditory communicative signals in horses MARC REMACLE, CLAIRE DIEDERICH	16:15
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Coffee and Poster Presentations		16:30
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TIMETABLE

Domestic / Wild Animal Welfare

50	Welfare of sheep in traditional and novel housing systems in Norway SOLVEIG MARIE STUBSJØEN ET AL.	17:00
52	Survey on management and welfare of Livestock Guardian Dogs in twenty-seven sheep and goat farms in the Tuscany Emilian Apennine area MARIANA ROCCARO ET AL.	17:15
55	Towards an improvement of dairy donkey welfare: the development of good animal management practices guidelines FRANCESCA DAI ET AL.	17:30
58	A program for the feral cat population control in Aoste, Italy MARIA CRISTINA OSELLA	17:45
61	Development of an observational quantitative temperament test in parrots CAROLINE GILBERT ET AL.	18:00
63	From scientific evidence to horse welfare: Understanding barriers and drivers to implementation of optimal horse-care practices CHANTIL SINCLAIR ET AL.	18:15
	Welcome Reception	19:00

TIMETABLE

Friday, 28th September 2018 –
Joint Behavioural Medicine and
Animal Welfare Science, Ethics and Law Day

Joint Session
Behavioural Medicine and
Animal Welfare Science, Ethics and Law

69	Do animals need play and if yes – can owners be a sufficient partner? Implications and consequences for animal welfare NADJA AFFENZELLER	09:00
72	Changing human behaviour to bring about positive changes in animal welfare, with focus on farm animal welfare CATHY DWYER, FRITHA LANGFORD	10:00
	Coffee and Posters	11:00
79	Insight into human-animal-dyads - current research on who is influencing whom and how this is connected to animal welfare NADJA AFFENZELLER, GIULIA CIMARELLI	11:30
84	Do animals need their mothers? CATHY DWYER	12:30

Lunch / ECAWBM AGM 13:30

TIMETABLE

Parallel Sessions

Animal Welfare Science, Ethics and Law

89	Animal-visitor interaction in zoos: an assessment protocol dealing with different educational, ethical and animal welfare aspects BARBARA DE MORI ET AL.	15:00
91	Qualitative behavioural assessment of sheep is associated with the farmer's intrinsic motivation KARIANNE MURI ET AL.	15:15
93	Welfare assessment with Welfare Quality® protocol and white blood cells evaluation in broiler flocks from different management systems LUIGI IANNETTI ET AL.	15:30
97	Agony breeding - people's perception of breed-related welfare problems in Germany FRANZISKA KUHNE ET AL.	15:45
99	French veterinary practitioners and animal abuse: a survey DENISE REMY ET AL.	16:00
101	Roar! Intraspecific aggression in a captive lion (Panthera leo), blending animal welfare, ethics and behavioural medicine VALERIE JONCKHEER-SHEEHY	16:15
Coffee and Poster Presentations		16:30

TIMETABLE

103	A critical review of the literature about the link between human and animal abuse ORIANE TALABART, DENISE REMY	17:00
105	Professional confidentiality versus the reporting of abuse in France: legal and ethical analysis DENISE REMY	17:15
107	On Materia Medica and Meridians – Should European Veterinary Regulators embrace or ban the practice of Traditional Chinese Medicine? MANUEL MAGALHÃES- SANT'ANA ET AL.	17:30
109	Associations of caretaker attitudes with alpaca behaviour INES WINDSCHNURER ET AL.	17:45
111	A qualitative study of children's attitudes in regard with animal captivity in zoos JULIE GAILLARD, DENISE REMY	18:00
113	A qualitative study of animal welfare inspectors' moral stress in France MELISSA MARTIN, DENISE REMY	18:15
ESVCE AGM		18:30
Social Dinner		20:00

TIMETABLE

 Parallel Sessions
 Behavioural Medicine

115	Is an Attention Deficit Hyperactivity Disorder (ADHD) rating scale modified for use in dogs useful for discriminating between a Hypersensitivity-Hyperactivity (HSHA) population and healthy matched controls? NATHALIE MARLOIS ET AL.	15:00
117	Development of behaviour tests for age-related cognitive decline in family dogs PATRIZIA PIOTTI ET AL.	15:15
119	How language used to describe dog behaviour may both inform and prejudice perception and accurate interpretation of canine intent KENDAL SHEPHERD	15:30
121	A novelty test to assess temperament in equine athletes TIAGO MENDONÇA ET AL.	15:45
123	Intraspecific horse aggression VALERIE JONCKHEER- SHEEHY	16:00
125	Firework fears in dogs – links with health, demographics, behaviour problems, and owner training effort STEFANIE RIEMER, SARAH GÄHWILER	16:15
Coffee and Poster Presentations		16:30

TIMETABLE

127	Anxiolytic effect of dexmedetomidine oromucosal gel (Sileo®) and gabapentin in feline travel anxiety model GARY LANDSBERG ET AL.	17:00
129	Supplementation with a novel lipid extract improves frontal lobe linked cognitive deficits in aged beagle dogs JOSEPH ARAUJO ET AL.	17:30
131	Imepitoin: preclinical and clinical evidence of its potential as an anxiolytic DANIEL S. MILLS ET AL.	18:00
ESVCE AGM		18:30
Social Dinner		20:00

TIMETABLE

**Saturday, 29th September 2018 –
Behavioural Medicine Day**

135	Development and validation of a canine travel anxiety model ISABELLE MOUGEOT ET AL.	09:00
138	I think my dog is relaxed. Isn't he? Owner awareness regarding their dog's signalling TINY DEKEUSTER, KATRIEN VERSCHUEREN	09:30
140	Objective Pain Assessment in Donkeys – Scale Construction MACHTELD VAN DIERENDONCK ET AL.	10:00
Coffee and Poster Presentations		10:30
142	“Sensory Processing Sensitivity”: a dog’s personality moderates the influence of owner personality and communication style on the occurrence of behaviour problems MAYA BRÄM ET AL.	11:00
144	Problem solving strategies in family dogs (Canis familiaris) diagnosed with separation anxiety-related disorders after a short separation from the owner, in controlled laboratory setting. PAULA PEREZ FRAGA ET AL.	11:15
146	Effects of “reading to dogs” on reading practice and cognitive abilities in children with pervasive developmental disorder STEFANIA UCCHEDDU ET AL.	11:30

TIMETABLE

148	Puppy Classes may positively affect the behaviour of adult dogs separated from their litters too early LUDOVICA PIERANTONI ET AL.	11:45
150	Developing a psychometric tool to measure frustration in dogs KEVIN MCPHAKE ET AL.	12:00
152	Behavioural and endocrine responses of companion dogs (Canis familiaris) to short separation-reunion with the owner in a novel environment FEDERICA PIRRONE ET AL.	12:15
Lunch / GTVMT AGM		12:30
154	Diagnostic performance of individually trained diabetic mellitus alert dogs: a blinded prospective observational study ANKE GÖRLINGER ET AL.	14:30
158	Associations between personality traits and disease prevalence in the family dog (Canis familiaris); a psychosomatic approach LINDA GERENCSÉR, SZILVIA FEKETE	15:00
160	Dog desocialisation during adolescence NATHALIE MARLOIS, CLAUDE BÉATA	15:30
Coffee and Poster Presentations		16:00
162	The Science of Fear Free: Reviewing the evidence GARY LANDSBERG	16:15

TIMETABLE

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|-----|--|-------|
| 165 | Fear Free Handling; Combatting Interspecific dog aggression in the veterinary clinic
VALERIE JONCKHEER- SHEEHY, MARJANNE ZAAL | 16:45 |
| 167 | A descriptive study of Bengal cat behaviour in Belgium and The Netherlands
CHRISTEL MOONS ET AL. | 17:00 |
| 168 | Introduction to Clinical Ethology in Ferrets
CARLOS GRAU PARICIO | 17:15 |
| 170 | From feline idiopathic ulcerative dermatitis to feline behavioural self-induced ulcerative dermatitis
EMMANUELLE TITEUX ET AL. | 17:30 |
| 172 | Hyperactivity disorder in the mirror of dog-robot interactions
STÉPHANE BLEUER- ELSNER, ANNA ZAMANSKY | 17:45 |

TIMETABLE

Poster

Posters on Animal Welfare, Ethics and Law

- | | |
|-----|--|
| 177 | Caring for food — mutual cooking in animal owners as healthy eating style change and sustainable food practice
BRUNO BELJAK |
| 179 | Characterization of adopted dogs and cats
SANDRA CARDOSO ET AL. |
| 181 | Proposal of a method used in the assessment of welfare in research catteries
ELISA CODECASA ET AL. |
| 183 | Bruised Turkey's Wings at Ante-Mortem
JOHN CRANLEY |
| 184 | Animal welfare in Italian long-term shelters. Benchmark against an "ideal shelter"
PAOLO DALLA VILLA ET AL. |
| 186 | Correlation between free choice profiling scores and quantitative assessment of elephant behaviour
BARBARA DE MORI ET AL. |
| 188 | Exposure to stress in different categories of racing pigeons at the time of racings
ALENKA DOVC ET AL. |
| 191 | Assessing welfare and improving human-animal relationship in beef cattle farms: a case study in France
CAROLINE GILBERT ET AL. |
| 193 | Burnout in Spanish veterinarians
ÁNGELA GONZÁLEZ-MARTÍNEZ ET AL. |

- 195 **Farmer awareness and control strategies of feather cover damage in laying hens**
ALEXANDRA HARLANDER-MATAUSCHEK ET AL.
- 197 **Hens consume excreta of other hens despite excreta-free feed being available**
ALEXANDRA HARLANDER-MATAUSCHEK ET AL.
- 199 **A behavioural patient from shelter becomes a police dog**
XENIA KATZURKE
- 200 **Happy tail syndrome in a sheltered Great Dane**
XENIA KATZURKE
- 201 **Technopathies of the limbs in finishing pigs**
SANDRINA KLEIN ET AL.
- 202 **Talking to cows – a comparison of reactions to playback and ‘live’ talking during human-cattle interactions**
ANNIKA LANGE ET AL.
- 204 **Human-reptile bond and its implication for the welfare of domestic semiaquatic turtles in Portugal**
LEONOR LOBATO GUIMARAES ET AL.
- 206 **Blood biochemical parameters in free-ranging red deer (*Cervus elaphus elaphus*) after chemical and physical restraint**
CHIARA MARITI ET AL.
- 208 **Three years of research on manipulable materials in Italian heavy pig production: a synopsis**
ELEONORA NANNONI ET AL.
- 210 **Palliative sedation as alternative to pet euthanasia**
ANNAMARIA PASSANTINO ET AL.
- 213 **What’s new? Individual variation in response to novelty in minipigs (*Sus scrofa domesticus*)**
PAULA PEREZ FRAGA

- 215 **Effects of feeding enrichment on the behavior and welfare of captive wolves (*Canis lupus lupus*)**
GIACOMO RIGGIO ET AL.
- 217 **Effect of rubber mats on behavioural and health indicators in weaning and fattening Italian heavy pigs**
GIACOMO ROVELLI ET AL.
- 220 **Multidisciplinary Educational Approach for Improving the Well-being of Cats and Dogs in a family setting**
YASEMIN SALGIRLI DEMIRBAS ET AL.
- 222 **Evaluation of the relevance of sex hormones in the faeces of the Hermann’s tortoise (*Testudo hermanni*) by the ELISA method**
MATEJA STVARNIK ET AL.
- 224 **Pilot study on the effect of classical music played with an audio ear net on the stress of horses during medical X-Ray examinations**
EMMANUELLE TITEUX ET AL.
- 226 **New housing in horses: are “paddock paradise” and “active stables” really improving welfare?**
EMMANUELLE TITEUX ET AL.
- 228 **Biosecurity as a welfare component in broiler farms: How it is related to the prevalence of resistant strains of *Escherichia coli***
ANNA XEXAKI ET AL.
- 230 **Perspective of the Portuguese society towards bullfights**
YARA ZAU ET AL.

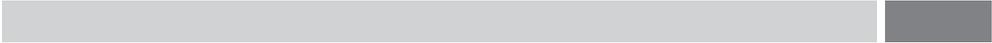
Posters on Behavioural Medicine

- 235 **Prescription of psychotropic drugs for dogs during New Year's Eve by Austrian and German veterinarians and their attitudes to noise aversion**
CHRISTINE ARHANT ET AL.
- 237 **The emotional impact on veterinarians caused by the death of their patients**
S. MOREIRA BERGAMINI ET AL.
- 239 **The use of 4A scale for veterinary guiding in canine behavioral disorders: first results of an on-going study**
STEPHANE BLEUER-ELSNER ET AL.
- 242 **Effect of Felisept spray® on signs of travel anxiety in cats**
SIMONA CANNAS ET AL.
- 244 **Characteristics of cats submitted to behavioral examination: a retrospective study**
SIMONA CANNAS ET AL.
- 246 **Partial rewarding during clicker training in dogs: effects on learning speed and affective state**
GUILIA CIMARELLI ET AL.
- 248 **Psychoactive drugs – rational use to change dog and cat's stress behaviour during hospitalization**
JOAO PEDRO DA SILVA-MONTEIRO, M. DUARTE-ARAÚJO
- 250 **Evaluation of empathy levels towards animals using a validated scale by Paul, (2000) within a population sample in Mexico City**
MARIANA DE LA TORRE DÍAZ ET AL.
- 252 **A survey investigating the observed frequencies of conflict signs between cats in multiple cat households**
ASHLEY L. ELZERMANN ET AL.

- 254 **Enhancing dogs' welfare during a veterinary consultation: impact of environmental factors and positive interactions before the consultation**
CAROLINE GILBERT ET AL.
- 256 **"Edda" One Small Step a Day – Consultation and training against aggression of unknown origin**
STEPHANIE GRATH
- 261 **The first assessment of dog bite prevention programme for pre-school children in Turkey**
SEVIM ISPARTA ET AL.
- 264 **Obsessive-compulsive disorder in dogs and cats: A retrospective study of 60 cases (2010-2017)**
HILAL KURUM ET AL.
- 267 **Assessing Stress in Laboratory Dogs to Car Rides and Rehousing**
GARY LANDSBERG ET AL.
- 270 **Risk factors related to canine aggression towards family members in Argentina**
SUSANA LE BRECH ET AL.
- 272 **A Tale of Two Tails: A Comparison of Two Presentations of Tail Chasing**
JACQUI LEY
- 274 **Coprophagy in dogs: related factors**
ROBERTA LUCIANI ET AL.
- 276 **Comfort foods in chronically stressed dogs: effects on ghrelin and cortisol levels**
ISABEL LUNO ET AL.
- 278 **Effects of petting before a brief separation from the owner on dog behavior and physiology: a pilot study**
CHIARA MARITI ET AL.

- 280 **Interest of cyproterone acetate in offensive social aggressions in dogs: 3 cases**
SYLVIA MASSON, GÉRARD MULLER
- 282 **Long-term effect of high dose fluoxetine treatment on hypersensitivity-hyperactivity syndrome in dogs: a preliminary retrospective study**
SYLVIA MASSON, EMMANUEL GAULTIER
- 284 **Monitoring dog's daily activity level with a remote device in separation related disorders: a clinical report**
MANUEL MENGOLI ET AL.
- 286 **Effects of a Botanical Blend on Mild Car-Ride Induced Anxiety in Laboratory Dogs**
ISABELLE MOUGEOT ET AL.
- 288 **Feeding dogs from raised bowls – a pilot study**
SIMONA NORMANDO ET AL.
- 290 **Effects of human-animal interaction and isolation on salivary oxytocin levels in 8 dogs**
ASAHI OGI ET AL.
- 293 **Influence of gonadectomy on canine behavior**
CLARA PALESTRINI ET AL.
- 295 **Automatic identification of separation anxiety-related behaviours in family dogs (Canis familiaris) in controlled laboratory setting**
PAULA PEREZ FRAGA ET AL.
- 297 **Habituation effects on food choice in dogs – implications for training**
STEFANIE RIEMER ET AL.
- 299 **Cat exercise wheel – a new therapeutic tool for cats?**
SABINE SCHROLL

- 300 **Quick Guide Kitten Kindergarden – practical implementation of a new concept**
SABINE SCHROLL
- 302 **Development of a novel laboratory model reproducing everyday mild stressors in fearful dogs**
EMMANUELLE TITEUX ET AL.
- 304 **Comparison of clomipramine and fluoxetine treatment in dogs with tail chasing**
EBRU YALCIN
- 306 **Use of fluoxetine to treat stereotypical pacing behavior in a brown bear (Ursus arctos)**
EBRU YALCIN, NILUFER AYTUG



THURSDAY

Ethics committees in animal research: law boundaries and beyond

C. Grau Paricio

Conflicts of interest: The author declared none.

Keywords: ethics, ethics committees, European legislation, laboratory animals, ethics education

The European legislation established laboratory animal research procedures to be evaluated by ethics committees when pain suffered was equal or higher than pain produced by a needle introduced in good veterinary practice (1). This boundary and others frame the need or not for mandatory ethics advice.

However, this definition mostly applies to biomedical research, where the majority of laboratory animal research is carried out and these limits can be settled easily. It is more difficult to fit in those definitions in the case of behavioural or observational research, where physical pain is likely to be replaced by distress or anxiety. In this talk I will discuss these limits and the role of ethics committees beyond laws. Their role should include ethics education, advice and debates within the research community. Beyond researchers, society should receive the benefits of a policy encouraging transparent information and education in animal research, that would stimulate ethical debate.

REFERENCES

1. EUROPEAN UNION (2010)
'Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes.', Official Journal of the European Union, pp. 33–79. doi: 32010L0063.

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Consent in companion animal veterinary practice

A. Fawcett

Conflicts of interest: The author declares none in regard to this presentation.

Keywords: consent, companion animals, autonomy, animal welfare

One of the ethical challenges inherent in veterinary practice is that patients cannot make informed decisions about any form of intervention¹. Veterinarians in practice perform a range of treatments, including preventative health care, medical and surgical interventions for acute and chronic conditions, and euthanasia, without the consent of patients. Yeates and Savulescu argue that there are grounds for treating companion animals differently than we might other animals, taking into account the nature of human-pet relationships, including mutual companionship, quasi-family membership, proximity, direct contact, privacy, dependence and partiality¹.

In human healthcare, there are ethical, epistemological and practical reasons for obtaining consent from patients². While most discussions regarding consent in the veterinary clinical context reflect the property status of animals, relating primarily to informing and respecting owner autonomy, the question remains whether the concepts of animal consent, assent and dissent add anything useful to clinical practice.

In this brief talk I will explain the concept of animal consent, how it relates to current approaches to minimising dissent, whether there is a place for the concept of assent, and why it may be useful in improving animal welfare in the veterinary clinical setting.

REFERENCES

1. YEATES, J. & SAVULESCU, J. 2017. Companion Animal Ethics: A Special Area of Moral Theory and Practice? *Ethical Theory and Moral Practice*, 20, 347-359.
2. JOHNSON, J., SMITH, K. & FAWCETT, A. (In Press) Consent and assent in veterinary practice and research.

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Animal Experimentation: Working Towards a Paradigm Change

K. Herrmann

Conflicts of interest: The author declares none. The author works as assistant scientist at the Johns Hopkins Center for Alternatives to Animal Testing, Baltimore, Maryland, USA.

Keywords: Animal experimentation, replacement, education
Three Rs

There are compelling scientific, ethical, social, and economic grounds for moving away from using animals in research, testing and education (e.g., 1-8). These have been driving some political change by implementing progressive legislation such as Directive 2010/63/EU on the protection of animals used for scientific purposes with the final goal of fully replacing live animal use (9). The paper will begin by exploring the main weaknesses of research based on animal models (1,2; 5-8; 10-24). It will then review the harms to both non-human animals (2,23) and humans (2,5,25) caused by the current reliance on animal-based research. The second part of the paper will focus on ways to work towards the adoption of animal-free methods and the main obstacles to overcome to achieve this. These include the vague provisions regarding animal replacement (2,9); the lack of education and training on alternative, animal-free approaches (2,23); insufficient funding for the development of animal-free methods (2,23,24) and confirmation bias within the animal research community that hinders change (26). Action on the political level appears central to achieving this imperative change as well as a human behavioural change and a shift towards a culture where scientists are rewarded for producing valid and reproducible results using methods that do not rely on animals, and that are relevant to society in general, and, in case of medical research, to patients in particular (1,2,23,27).

REFERENCES

1. HARRIS, R. (2017). Rigor mortis. How sloppy science creates worthless cures, crushes hope, and wastes billions. New York: Basic.
2. HERRMANN, K. AND JAYNE, K. (EDS.) (forthcoming 2018). Animal experimentation: working towards a paradigm change. Brill Human-Animal studies series.
3. CLEMENCE, M. AND LEAMAN, J. (2016). Public attitudes to animal research in 2016. A report by Ipsos MORI for the Department for Business, Energy & Industrial Strategy, Ipsos MORI Social Research Institute. [online] Available at: <https://www.ipsos.com/sites/default/files/publication/1970-01/sri-public-attitudes-to-animal-research-2016.pdf> [Accessed 15 January 2018].
4. JONES, J. AND SAAD, L. (2017). Gallup Poll Social Series: Values And Beliefs. Gallup News Service. [online] Available at: http://www.gallup.com/poll/210542/americans-hold-record-liberal-views-moral-issues.aspx?g_source=2017+poll+animals&g_medium=search&g_campaign=tiles [Accessed 10 January 2018].
5. AKHTAR, A.Z. (2015). The flaws and human harms of animal experimentation. Cambridge Quarterly of Healthcare Ethics, 24(04), pp. 407-419.
6. POUND, P. AND BRACKEN, M.B. (2014). Is animal research sufficiently evidence based to be a cornerstone of biomedical research?. BMJ: British Medical Journal, 348, p. g3387.
7. POUND P., EBRAHIM S., SANDERCOCK P., BRACKEN M.B., ROBERTS, I. (2004). Where is the evidence that animal research benefits humans?. BMJ: British Medical Journal, 328(7438), pp. 514–517.
8. FREEDMAN, L.P., COCKBURN, I.M., SIMCOE, T.S. (2015). The Economics of Reproducibility in Preclinical Research. PLOS Biology [online] 13(6): e1002165. Available at: <https://doi.org/10.1371/journal.pbio.1002165> [Accessed 15 January 2018].

9. European Parliament and the Council of the European Union (2010). Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes. Official Journal of the European Communities, L 276, pp. 33–79.
10. JOFFE, A. R., BARA, M., ANTON, N. AND NOBIS, N. (2016). Expectations for the methodology and translation of animal research: a survey of the general public, medical students and animal researchers in North America. Alternatives to Laboratory Animals, 44(4), pp. 361-381.
11. BAILEY, J. (2014). Monkey-based research on human disease: the implications of genetic differences. Alternatives to Laboratory Animals, 42, pp. 287-317.
12. CAVANAUGH, S. E., PIPPIN, J. J. AND BARNARD, N. D. (2014). Animal models of Alzheimer disease: historical pitfalls and a path forward. Alternatives to Animal Experimentation, 31(3), pp. 279-302
13. PISTOLLATO, F., OHAYON, E. L., LAM, A., LANGLEY, G. R., NOVAK, T. J., PAMIES, D., PERRY, G., TRUSHINA, E., WILLIAMS, R.S.B., ROHER, A.E., HARTUNG, T., HARNARD, S., BARNARD, N., MORRIS, M.C., LAI, M., MERKLEY, R. AND CHANDRASEKERA, P.C. (2016). Alzheimer disease research in the 21st century: past and current failures, new perspectives and funding priorities. Oncotarget, 7(26), pp. 38999–39016.
14. PRINZ, F., SCHLANGE, T. AND ASADULLAH, K. (2011). Believe it or not: how much can we rely on published data on potential drug targets?. Nature Reviews Drug Discovery, 10(9), pp. 712-712.
15. SEOK, J., WARREN, H.S., CUENCA, A.G., MINDRINOS, M.N., BAKER, H.V., XU, W., RICHARDS, D.R., MCDONALD-SMITH, G.P., GAO, H., HENNESSY, L. AND FINNERTY, C.C. (2013). Genomic responses in mouse models poorly mimic human inflammatory diseases. Proceedings of the National Academy of Sciences, 110(9), pp. 3507-3512.
16. SHUAIB, A., LEES, K., LYDEN, P., GROTTA, J., DAVALOS, A., DAVIS, S., DIENER, H., ASHWOOD, T., WASIEWSKI, W. AND EMERIBE, U. (2007). NXY-059 for the treatment of acute ischemic stroke. New England Journal of Medicine, 357(6), pp. 562-571.

17. SLOFF, M., DE VRIES, R., GEUTJES, P., INTHOUT, J., RITSKES-HOITINGA, M., OOSTERWIJK, E. AND FEITZ, W. (2014). Tissue engineering in animal models for urinary diversion: a systematic review. *PLOS one*, 9(6), p. e98734.
18. PEREL, P., I. ROBERTS, I., E. SENA, E., P. WHEBLE, P., C. BRISCOE, C., P. SANDERCOCK, P., M. MACLEOD, M., L.E. MIGNINI, L.E., P. JAYARAM, P. AND K.S. KHAN, K.S. (2007). Comparison of treatment effects between animal experiments and clinical trials: systematic review. *British Medical Journal*, 334, pp. 197-206.
19. SEOK, J., WARREN, H.S., CUENCA, A.G., MINDRINOS, M.N., BAKER, H.V., XU, W., RICHARDS, D.R., MCDONALD-SMITH, G.P., GAO, H., HENNESSY, L. AND FINNERTY, C.C. (2013). Genomic responses in mouse models poorly mimic human inflammatory diseases. *Proceedings of the National Academy of Sciences*, 110(9), pp. 3507-3512.
20. SHUAIB, A., LEES, K., LYDEN, P., GROTTA, J., DAVALOS, A., DAVIS, S., DIENER, H., ASHWOOD, T., WASIEWSKI, W. AND EMERIBE, U. (2007). NXY-059 for the treatment of acute ischemic stroke. *New England Journal of Medicine*, 357(6), pp. 562-571.
21. PEREL, P., I. ROBERTS, I., E. SENA, E., P. WHEBLE, P., C. BRISCOE, C., P. SANDERCOCK, P., M. MACLEOD, M., L.E. MIGNINI, L.E., P. Jayaram, P. and K.S. Khan, K.S. (2007). Comparison of treatment effects between animal experiments and clinical trials: systematic review. *British Medical Journal*, 334, pp. 197-206.
22. CARVALHO, C., CRESPO, M. V., BASTOS, L. F., KNIGHT, A. AND VICENTE, L. (2016). Contribution of animal models to contemporary understanding of attention deficit hyperactivity disorder. *ALTEX*, 33(3), pp. 243-249.
23. HERRMANN, K. (accepted). Refinement on the way to replacement: are we doing what we can?

24. LANGLEY, G., ADCOCK, I., BUSQUET, F., CROFTON, K., CSERNOK, E., GIESE, C., HEINONEN, T., HERRMANN, K., HOFMANN-APITIUS, M., LANDESMANN, B., MARSHALL, L., MCIVOR, E., MUOTRI, A., NOOR, F., SCHUTTE, K., SEIDLE, T., VAN DE STOLPE, A., VAN ESCH, H., WILLET, C. AND WOSZCZEK, G. (2017). Towards a 21st-century roadmap for biomedical research and drug discovery: consensus report and recommendations. *Drug Discovery Today*, 22(2), pp. 327-339.
25. BIRKE, L., ARLUKE, A. AND MICHAEL, M. (2007). *The Sacrifice: How scientific experiments transform animals and people*. West Lafayette, Indiana: Purdue University Press.
26. HAIDT, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. Vintage.
27. RITSKES-HOITINGA, M. AND WEVER, K. (2018). Improving the conduct, reporting, and appraisal of animal research. Editorial. *BMJ: British Medical Journal*, 360, p. j4935.

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Veterinary students' own interests in welfare and ethics

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Conflicts of Interest: The author declared none
Keywords: Veterinary education, ethics, human-animal relationships, group working

This report describes a recent, novel approach to incorporating welfare and ethics into the Edinburgh undergraduate veterinary programme (BVM&S) through the development of a second-year course, Student Research Component (Foundation Skills) [SRC(F)]. SRC(F) requires students to work in small 'research groups' of four individuals to create and develop a joint research topic. The course is concerned with broad, inter-disciplinary themes which explore human-animal relations in global contexts, e.g. socio-economics, 'one health', sustainability, welfare and ethics. Students are given considerable freedom in developing their project as long as they engage with the over-arching themes; innovative approaches are encouraged. The research must not contain subject matter which is directly taught within the BVM&S veterinary degree, i.e. the students must explore broader contexts than pure bioscience.

The educational philosophy behind this assessed, 10-credit course will be described. Based on three presentations in successive years, the students' approach to welfare and ethics topics will be described. How do they conceive of welfare and ethics? What specific topics do they choose? How do they go about researching and presenting their subjects? Some ideas for the future development of similar courses will be presented in the context of education in welfare and ethics.

REFERENCE

1. BOYD, S., GARDINER, A., PHILIPS, C. ET AL (2017) 'Foundation skills for veterinary medical research'. In: Fung, D. & Carnell, B. Developing the Higher Education Curriculum: research-based education in practice. London: UCL Press.

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An ethical analysis of the evolution of zoos in the light of human conception of captivity

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Keywords: zoos, justification, ethics, historical aspects

Zoos have existed since 3500 AD (1) and have clearly undergone tremendous changes. These will be reviewed, analysed and questioned in the light of human conception of captivity.

Initially, zoos were signs of human power and domination over nature (1-3). Until the nineteenth century, they progressively became a means by which people discovered unknown animals captured either during explorations (3,4) or commercially exchanged (5). Captivity itself was not questioned. The growing ecological and ethical awareness that began at the end of the 19th century led to an increasing criticism of zoos (6), which were then obliged to justify their role (5). Consequently, zoos established partnerships and associations, and the architecture and the animal environments in zoos were radically transformed (3) (7). Zoos also came up with four goals: leisure, conservation of species, research and education (8).

The ethical analysis of each of these four objectives makes it possible to conclude that only the educational one could possibly justify animal captivity in a zoo (9-14). However, a critical review of the literature about the educational goal of zoos shows that studies are contradictory and incomplete (10, 12, 15-21). In the current context, it seems that the way this educational role is carried out could negatively influence people's attitudes in regard to animal captivity.

REFERENCES

1. GAY, P. (2005). Des zoos pour quoi faire ? Pour une nouvelle philosophie de la conservation. Paris: Delachaux et Niestlé, 223 p.
2. CYRULNIK, B. L'animal spectacle. In: MATIGNON, K, L and FOUGEA, F. (2011). La fabuleuse aventure des Hommes et des animaux. Paris: Fayard/Pluriel, pp 95-97.
3. BARATAY, É., HARDOUIN-FUGIER, É. (1998). Zoos. Histoire des jardins zoologiques en Occident (XVIe-XXe siècle). Paris: La Découverte, 294 p.
4. DESROUSSEAU, C. (2000). Du sérail au parc zoologique. [online]. *Vacarme*, n°11, pp. 25-27. Available at: <https://www.cairn.info/revue-vacarme-2000-1-p-25.htm> [accessed: 06.06.2017]
5. ESTEBANEZ, J. (2014). Des animaux-objets?: Réification, résistance et (re)qualification dans les zoos occidentaux. [online]. *Géographie et cultures*, n°91-92, pp.125-152. Available at: <https://doi.org/10.4000/gc.3364> [accessed: 12.06.2017]
6. DALE, D. (1999). Review of Malamund: Reading Zoos: Representations of Animals and Captivity. [online]. *H-Environment, H-Net Reviews*. Available at: <http://www.h-net.org/reviews/showrev.php?id=3291> [accessed: 08.06.2017]
7. ESTEBANEZ, J. (2011). Le zoo : Un espace politique et métaphysique. [online]. *Les cafés Géographiques*, n°15, pp 1-13. Available at: <http://cafe-geo.net/wp-content/uploads/zoo-espace-politique.pdf> [accessed: 03.06.2017]
8. WAZA. Website of the World association of zoos and aquarium. [online]. URL: <http://www.waza.org/fr/site/home> [accessed: 18th February 2017]
9. ZECCHINI, A. (2002). Les animaux sauvages captifs peuvent-ils rester "naturels"? [online]. *Courrier de l'environnement de l'INRA*, no 46, pp. 21-37. Available at: <http://www7.inra.fr/lecourrier/assets/C46Zecchini.pdf> [accessed: 21.07.2017]

10. SERVAIS, V. (1999). Zoos, éducation et malentendus. Essai d'anthropologie des émotions du visiteur de zoo. [online]. Cahiers d'Éthologie, Vol 19 n°1, pp 1-16. Available at: <https://orbi.ulg.ac.be/bitstream/2268/25415/1/Zoos.pdf> [accessed: 15.03.2016]
11. JOULIAN, F., ABEGG, C. (2008). Zoos et cause animale. Perspectives éthologique et anthropologique. [online]. Techniques et Culture, n° 50, pp. 120-143. Available at: <https://tc.revues.org/3945> [accessed: 12.06.2017]
12. BORN FREE ET AL. Website of the zoos of France [online]. URL: <http://www.zoo-de-france.com/content/enqu%C3%AAte-2011-sur-les-zoos-dans-lunion-europ%C3%A9enne-rapport-France> [accessed: 17.07.2016]
13. TOMAS, S. R., CROMPTON, J. L., SCOTT, D. (2003). Assessing service quality and benefits sought among zoological park visitors. Journal of Park and Recreation Administration, n°52, pp. 105-124.
14. STASZAK, J. F. (2000). A quoi servent les zoos ? Sciences humaines, n°108, pp. 80-87.
15. CLAYTON, S., FRASER, J., AND SAUNDERS, C. D. (2009). Zoo experiences: Conversations, connections, and concern for animals. [online]. Zoo Biology, Vol 28 n°5, pp. 377-397. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/19821500> [accessed: 17.08.2017]
16. FRASER, J. (2009). The anticipated utility of zoos for developing moral concern in children. Curator: The Museum Journal, Vol 52 n°4, pp. 349-361.
17. CHAUMIER, S. (2008). Quand les objets s'animent. [online]. Techniques et Culture, n°50, pp. 144-163. Available at: <http://tc.revues.org/3947> [accessed: 1st October 2016]
18. SERVAIS, V. (2012). La visite au zoo et l'apprentissage de la distinction humaine. [online]. Revue d'anthropologie des connaissances, Vol 6 n°3, pp. 625-652. Available at: <https://www.cairn.info/revue-anthropologie-des-connaissances-2012-3-page-625.htm> [accessed: 01.06.2017]
19. DESCOLA, P. (2005). Par-delà nature et culture. Paris : Gallimard, 640 p.

20. CYRULNIK, B., DE FONTENAY, É., SINGER, P., MATIGNON, K. L and ROSANE, D. (2013). Les animaux aussi ont des droits. Paris : Éditions du Seuil, 268 p.
21. JENSEN, E., WAGONER, B. (2010). Science Learning at the Zoo: Evaluating Children's Developing Understanding of Animals and their Habitats. [online]. Psychologie et society, Vol 3 n°1, pp. 65-76. Available at: http://www.psychologyandsociety.org/assets/original/2010/08/Wagoner_Jensen.pdf [accessed: 01.06.2017]

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The British animal health and welfare policy process: accounting for the interests of sentient species

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Conflicts of interest: The author declared there were none. The author is affiliated to the University of Winchester (UK). The research was funded internally at the author's previous institution (Royal Veterinary College, University of London)

Keywords: UK, government policy, animal health, animal welfare, sentience

British government policy that impacts animals is highly controversial and characterised by substantial public concern. The BSE scandal, the 2001 Foot and Mouth Disease crisis and live animal exports are examples. The British public is concerned because policy impacts animals that are sentient. The EU Treaty of Lisbon recognises animal sentience, and member states must 'pay full regard to the welfare requirements of animals'. Defra is responsible for most animal health and welfare policy in England. This paper constructs a normative framework of analysis to assess Defra policy making, and finds structural, resource and process factors that combine to exclude sentient animals from the policy process. In general, policy making does not account for the intrinsic value of sentient animals. In the appraisal of policy options, conducted as an economic cost-benefit analysis, animals' interests are subsumed under human interests. British policy making is influenced by pervasive reductionist ideologies of positivism and economics. The policy process is created by humans, for humans, and sentient non-humans are largely excluded. The paper proposes two key reforms to policy making: i) Animal Welfare Impact Assessment (AWIA), and ii) to create an Ethics Council for Animal Policy (ECAP). The AWIA is used to appraise potential impacts of policy options on sentient animals, whereas the ECAP is a Council of experts to inform government on public policy impacting animals. The paper applies AWIA and ethical appraisal to the policy issues of wild animals in circuses, bovine TB and badger culling and large indoor dairies Units (LDUs).

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The application of David Fraser's Practical Ethic in veterinary practice

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Conflicts of interest: The author declares none in regard to this presentation.

Keywords: veterinary ethics, One Welfare, ethical framework

The teaching of veterinary ethics often incorporates key ethical theories including teleological (outcome-based) theories such as utilitarianism, deontological theories, principlism, relational ethics and virtue ethics. Professor David Fraser developed a "practical ethic"[1] as an alternative approach consisting of four principles enabling decision makers to address concerns about animal welfare, human-wellbeing and the environment, while minimising the risks of unintended harm.

While this ethical approach was not developed with veterinarians in mind, it aligns well with the One Welfare[2] platform. In this short talk I will outline Fraser's "practical ethic" in relation to commonly taught ethical frameworks, apply it to a selection of veterinary scenarios and discuss its benefits and limitations as a tool for decision making in the veterinary clinical context.

REFERENCES

1. FRASER, D., A "Practical" Ethic for Animals. *Journal of Agricultural & Environmental Ethics*, 2012. 25(5): p. 721-746.
2. GARCIA PINILLOS, R., ET AL., One Welfare - a platform for improving human and animal welfare. *Veterinary Record*, 2016. 179(16): p. 412-413.

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The case for putting ethics back into policy making: A proposal for a UK Ethics Council for Animal Policy

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Conflicts of interest: The authors declared there were none. The first author is at the University of Winchester (UK); the second author is at Institute of Education UCL (UK). The research was funded internally at the first author's previous institution (Royal Veterinary College, University of London)

Keywords: Public policy, ethics, animals, UK

Substantial controversy has been a consistent feature of UK animal health and welfare policy, as evidenced by BSE, foot and mouth disease, Salmonella in eggs, bovine TB and badger policy, large indoor dairies, and animals in circuses. All policy issues include a substantial ethical component. However, there is currently no formal or consistent mechanism for expert ethical input to the policy process.

This paper proposes a body to be termed 'The Ethics Council for Animal Policy' to inform government on policy that significantly impacts sentient species. The paper reviews the following councils and frameworks to inform the UK Ethics Council: FAWC, Wolffian pragmatism, Nuffield Council of Bioethics, mixed ethical approaches, Banner's principles, the ethical matrix and ethical Delphi, multicriteria analysis, public participation and The Netherlands approach.

The UK Ethics Council for Animal Policy must be independent from government and members should have substantial expertise in ethics and related disciplines. A pluralistic six-stage ethical framework is proposed: i) Problematisation of the policy issue, ii) utilitarian analysis, iii) animal rights analysis, iv) virtue-based analysis, v) animal welfare ethical analysis, and vi) integrated ethics analysis. The paper concludes that an Ethics Council

for Animal Policy is necessary for just and democratic policy making in all societies that use sentient nonhuman species.

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Dog welfare, ethics and evidence based veterinary medicine: special focus on veterinary behavioural medicine

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Conflicts of interest: The authors declared there were none
Keywords: EVBM, animal behaviour, animal welfare

Evidence-based veterinary medicine (EBVM) integrates Evidence-based medicine (EBM) principles into veterinary medicine (VM) facilitating practice based on valid, clinically pertinent research data. This is challenging as VM covers many species of animals with often-different neurophysiology. Veterinary behavioural medicine (VBM) is a VM discipline, more notable than others for a lack of published clinically relevant data. VBM is concerned with the diagnosis, treatment and prevention of behaviour disorders in animals^{1,2}. Behaviour problems in dogs are a major welfare and ethical concern as they are the primary reason why veterinarians are requested to euthanise dogs^{3-5,10} or the animals are relinquished^{6-9,10}. Animal welfare is also compromised when behaviour problems are inaccurately diagnosed and/or flawed treatment strategies are recommended^{5,10}. The need to develop EBVM within VBM is urgent. True canine anxiety disorders are a significant welfare concern^{5,10}. Validated diagnostic criteria are largely lacking and phenotypic behaviour descriptions (based on direct and indirect behaviour observations) thought to reflect “emotional state” are

predominantly relied on. However, these are seldom sufficiently discrete to inform a neuropathologic (mechanistic) diagnosis.

We will review the canine anxiety disorder literature and suggest where diagnostic nuclear imaging techniques might be used to validate neuropathology as a means to bringing EBVM to the field. We will also examine modalities currently explored in treating refractory human depressive and pathologically anxious patients, that may be of potential interest for veterinary patients harmonising EBM and EBVM.

REFERENCES

1. ECAWBM. European College of Animal Welfare and Behavioural Medicine. [online]. Available at: <http://www.ecawbm.com>. [Accessed 07 Mar. 2018].
2. ACVB. American College of Veterinary Behaviorists. [online]. Available at: <http://www.dacvb.org>. [Accessed 07 Mar. 2018].
3. MIKKELSEN, J. AND LUND, J.D., 2000. Euthanasia of dogs due to behavioural problems: an epidemiological study of euthanasia of dogs in Denmark, with a special focus on problems of aggression. *Eur. J. Comp. Anim. Pract.*, 10, pp.143-150.
4. HUNTHAUSEN, W. AND SEKSEL, K., 2002. Ch 6 Preventative Behavioural Medicine BSAVA Manual of Canine and Feline Behavioral Medicine eds. D Horwitz, D Mills and S Heath p, 49.
5. OVERALL, K., 2013. *Manual of Clinical Behavioral Medicine for Dogs and Cats*. Elsevier Health Sciences.
6. PATRONEK, G.J., GLICKMAN, L.T., BECK, A.M., MCCABE, G.P. AND ECKER, C., 1996. Risk factors for relinquishment of dogs to an animal shelter. *Journal of the American Veterinary Medical Association*, 209(3), pp.572-581.
7. SALMAN, M.D., HUTCHISON, J., RUCH-GALLIE, R., KOGAN, L., NEW JR, J.C., KASS, P.H. AND SCARLETT, J.M., 2000. Behavioral reasons for relinquishment of dogs and cats to 12 shelters. *Journal of Applied Animal Welfare Science*, 3(2), pp.93-106.

8. SEGURSON, S.A., SERPELL, J.A. AND HART, B.L., 2005. Evaluation of a behavioral assessment questionnaire for use in the characterization of behavioral problems of dogs relinquished to animal shelters. *Journal of the American Veterinary Medical Association*, 227(11), pp.1755-1761.
9. MILLER, D.D., STAATS, S.R., PARTLO, C. AND RADA, K., 1996. Factors associated with the decision to surrender a pet to an animal shelter. *Journal of the American Veterinary Medical Association*, 209(4), p.738.
10. JONCKHEER-SHEEHY, V., PEREMANS, K., BAEKEN, C. AND OVERALL, K., 2017. Dog welfare and emotions: The diagnosis and treatment of canine anxiety disorders. In *ISAE International Society of Applied Ethology*.

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Towards a more accurate evaluation of acute pain: does standardised training of assessors improve the inter-observer reliability of the Horse Grimace Scale (HGS)?

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Conflicts of interest: The authors declared there were none.
Keywords: horse; welfare; Horse grimace scale; training

The Horse Grimace Scale (HGS), a facial-expression-based pain coding system, is able to identify a range of pain conditions^{1,2,3}. This work aims to quantify how standardised training of new assessors on HGS scores affects inter-observer reliability and applicability in everyday clinical practice.

Twenty-eight university students (without horse experience) were recruited. Prior to any training, students were asked to score 10 pictures of horse faces using the six Facial Action Units (FAUs) of the HGS. They then received a 30-min training session that included detailed descriptions and example pictures of each FAU. After training, students scored another 10 pictures. Inter-observer reliability among the students was assessed pre- and post-training by calculating Intra-class correlation coefficient (ICC) on single FAUs and overall HGS score. Agreement pre- and post-training on single FAUs between each student and an expert was evaluated with Cohen's Kappa.

Students' reliability improved with the training for each FAU as well as for the overall HGS score: ICCs ranged from -0,167 to 0,959 pre-training, increased to 0,812 to 0,983 post-training. Post-training, the agreement (Cohen's Kappa) with the expert increased in 21 students for stiffly backwards ears, 20 for orbital tightening, 13 for tension above the eye area, 19

for prominent strained chewing muscles, 25 for mouth strained and 19 for strained nostrils.

Our results suggest that a standardised training can improve the reliability of HGS. To ensure that reliability in scoring is at an acceptable level, it is paramount to evaluate the inter-observer reliability before applying the HGS in clinical settings.

REFERENCES

1. DALLA COSTA, E., MINERO, M., LEBELT, D., STUCKE, D., CANALI, E., LEACH, M.C., 2014. Development of the Horse Grimace Scale (HGS) as a pain assessment tool in horses undergoing routine castration. *PLoS ONE* 9.
2. DALLA COSTA, E., STUCKE, D., DAI, F., MINERO, M., LEACH, M.C.M.C., LEBELT, D., COSTA, E.D., STUCKE, D., DAI, F., MINERO, M., LEACH, M.C.M.C., LEBELT, D., 2016. Using the horse grimace scale (HGS) to assess pain associated with acute laminitis in horses (*Equus caballus*). *Animals* 6.
3. LECCHI, C., DALLA COSTA, E., LEBELT, D., FERRANTE, V., CANALI, E., CECILIANI, F., STUCKE, D., MINERO, M., 2018. Circulating miR-23b-3p, miR-145-5p and miR-200b-3p are potential biomarkers to monitor acute pain associated with laminitis in horses. *Animal* 12, 366–375.

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Effect of fluralaner on behavioural and stress indicators in laying hens infested with *Dermanyssus gallinae*

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Conflicts of interest: The authors declare they have no competing interests.

Keywords: Hens, infestation *Dermanyssus*, ectoparasites, behaviour

Poultry Red Mite infestation (PRM, *Dermanyssus gallinae*) is widely recognized as a major welfare threat in layers. The effect of a new drinking water PRM treatment (fluralaner, Exzolt[®], MSD Animal Health) on behavioural and stress markers was investigated. This study involved a commercial layer house with enriched cages, containing 12,700 29 week-old hens infested with PRM. The infestation was quantified weekly using mite traps, over 13 weeks. Seven weeks after the study start, the hens were administered Exzolt[®], twice seven days apart, at the recommended dose. Behavioural parameters were assessed weekly through scan (activity) and focal sampling (other behaviours). One week before treatment (baseline), and one and five weeks after, blood corticosterone was measured from 50 hens.

The pre-treatment PRM infestation level was high (average ca. 1500-2200 mites per trap) and dramatically decreased immediately after treatment until the end of the study (< 2 mites per trap). For the whole

post-treatment period, hens showed significantly lower head scratching, head shaking and auto-preening, both during the day and at night. After treatment, severe feather pecking decreased during the day ($p=0.004$). During the night, the percentage of active hens decreased from 34% before to 11% after treatment ($p<0.0001$). Blood corticosterone decreased from 4.0 ng/mL (baseline) to 2.7 ng/mL ($p=0.02$) and 1.7 ng/mL ($p=0.003$) respectively the week of the second treatment administration and five weeks later.

It is concluded that effective treatment of PRM infestation improves welfare of laying hens.

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Tail and ear movements as potential feasible indicators of emotions in pigs

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Conflicts of interest: The authors declared they had none
Keywords: behaviour, pigs, ear movement, tail movement, welfare

A better understanding of animal emotions is an important goal in animal welfare science, but few reliable tools exist for its measurement (1). Play behaviour is recognised as triggering positive emotions in mammals (2), and previous studies have suggested that tail movements may indicate positive emotions in pigs, while ear movements may indicate negative emotions, or a decrease in positive emotions (3,4). This study investigated whether toys provision to solicit play behaviour was associated with tail and ear movements, with the aim of investigating their use as indicators of different emotions in pigs. Sixteen mini-pigs were involved in two situations: one Play session and one Control session. During Play sessions, pigs were placed in their pens of two individuals, where two toys were introduced. During Control sessions, no toys were provided. Behaviours were scored from videos using continuous recording. Results showed that tail movement duration was significantly higher in Play than in Control sessions ($DF=15$; $t=-3.40$; $p<0.01$). Tail movement frequency also varied significantly between Play and Control sessions ($DF=15$; $t=2.96$; $p=0.01$), being higher during Control sessions. Ear movement frequency was significantly higher in Controls than in Play sessions ($DF=15$; $t=4.69$; $p<0.01$). Finally, the 69% of the pigs performed displacement behaviours during Control sessions, while none displayed it during Play sessions.

In conclusion, tail movement duration increases in a play context, and ear movement frequency and displacement behaviours increase in a control one. These results could be useful for improving the analysis of emotions in pigs and assessing animal welfare (5).

REFERENCES

1. BOISSY, A. AND LEE, C. (2014). How assessing relationships between emotions and cognition can improve farm animal welfare. *Rev. Sci. Tech.*, 33 (1), pp. 103–110.
2. MELLOR, D., PATTERSON-KANE, E. AND STAFFORD, K.J. (2009). *The Sciences of Animal Welfare (UFAW Animal Welfare)*. John Wiley & Sons Palmerston North, pp. 72–93.
3. REIMERT, I., BOLHUIS, J.E., KEMP, B. AND RODENBURG, T.B. (2013). Indicators of positive and negative emotions and emotional contagion in pigs. *Physiol. Behav.*, 109, pp. 42–50.
4. MARCETRIUS, M., COZZI, A., BIENBOIRE-FROSINI, C., TERUEL, E., CHABAUD, C., MONNERET, P., LECLERCQ, J., LAFONT-LECUELLE, C. AND PAGEAT, P. (2018b). Selection of putative indicators of positive emotions triggered by object and social play in mini-pigs. *Applied Animal Behaviour Science*, 202, pp. 13-19.
5. MARCETRIUS, M., PAGEAT, P., BIENBOIRE-FROSINI, C., TERUEL, E., MONNERET, P., LECLERCQ, J., LAFONT-LECUELLE, C. AND COZZI, A. (2018c). Tail and ear movements as possible indicators of emotions in pigs. *Applied Animal Behaviour Science – In press*.

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Nociceptive threshold of goat kids undergoing injection of clove oil or isoeugenol for disbudding – a preliminary study

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Conflicts of interest: None were declared

Keywords: goat kids, disbudding, clove oil, isoeugenol

Disbudding in goat kids is a widespread husbandry procedure involving pain and risk of brain damage. A recent study presented injection of clove oil under the horn bud as an alternative disbudding method. Clove oil, with its active substance eugenol, is cytotoxic but has anaesthetic effects, with potential benefits to welfare compared to the more common hot iron disbudding alone. In this preliminary study we investigated the development of mechanical nociceptive thresholds (MNT) of goat kids injected with clove oil or isoeugenol under the horn bud.

20 male goat kids, 2-5 days old at the start of the experiment, were randomly allocated to clove oil (n=10) or isoeugenol (n=10) injection. An experimenter blind to the treatment measured MNT via a pressure algometer in three measurement points around each horn bud (ventral, medial, rostral) and with von Frey Filaments at the lateral point. Measurements were taken at the following time points (hours relative to injection): t-27, t-3,

t0 (post-injection), t3, t24. There was an effect of injection depending on time point (time point*injection, $F(5,68)=2.74$, $p=0.03$). MNT were lower at t0, increased at t3 to reach the starting level of t-27 and, for clove oil only, decreased again at t24.

Despite the large variation in MNT, our results suggest that clove oil and isoeugenol induced hypersensitivity, with potential implications to pain experienced by the animals. Nonetheless, a local anaesthetic effect may be present, as suggested by the reduced sensitivity observed 3 hours post-injection, but its efficacy over time remains unclear.

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Behavioural and patho-physiological response as possible signs of pain in dairy cows during *Escherichia coli* mastitis: A pilot study

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Conflicts of interest: The authors declared there were none
Keywords: cows, welfare, mastitis, behaviour, physiological measurements

Bovine mastitis is one of the most commonly occurring diseases in the dairy industry and has been pinpointed as a major welfare problem. Pain during mastitis is generally assessed through behaviour, but a combination of various indicators would increase the chances of detecting pain and assessing its intensity. The aim of this study was to assess behavioural and patho-physiological responses as possible signs of pain experienced by cows after experimental intramammary challenge (mastitis) with *Escherichia coli*.

Six Holstein-Friesian cows received an inoculation of *E. coli* P4 in one healthy quarter. Evolution of the disease was assessed using bacteriological growth and somatic cell counts (SCC). Cows' responses to the challenge was monitored by direct behavioural and clinical observations, data loggers, rumen temperature sensor, and indicators of inflammation, stress and oxidative status. From the data recorded, the variables that contributed most to the discrimination of mastitis phases were obtained by factorial discriminant analysis.

Baseline levels of all indicators were compared with values before challenge. More specifically, we weighted data relating to lying behaviour by observations at the same hour in the day before challenge to eliminate the circadian rhythm effect. We identified three phases, discriminated by the factorial discriminant analysis with good performance. Nine indicators varied according to the phase of the disease: cows' attitude towards their surroundings, tail position, clinical signs, ear position, variation of postural changes, haptoglobin, Serum Amyloid A (SAA), cortisol blood levels and rumen temperature as a surrogate for body temperature. In Phase 1 (4 to 8h post-inoculation), *E. coli* proliferated exponentially in milk, whereas inflammation indicators remained at baseline levels. Cows were less attentive towards their surroundings (median score, 0.63) and postural changes (lying/standing) were less frequent (0.75 times from baseline). In Phase 2 (12 to 24 h post inoculation), bacterial concentrations peaked around 12 h and then began to decrease, concomitantly with a sharp SCC increase. Cows were less attentive towards their surroundings (score, 0.54), and had high plasma cortisol (31.3 ng/ml), SAA (100.3 µg/mL) and rumen temperature was increased (40.3°C). In Phase 3 (32 to 80 h post inoculation), bacterial concentrations decreased concomitantly with a high SCC levels. Cows had high levels of haptoglobin (0.57 mg/mL) and SAA (269 µg/mL) but showed no behavioural changes.

Dairy cows displayed changes of behavioural, inflammatory and stress parameters after *E. coli* mammary inoculation. Our results suggest that cows may have experienced discomfort in the pre-clinical phase (Phase 1), pain in the acute phase (Phase 2), but neither discomfort nor pain in the remission phase (Phase 3). Although larger controlled studies are now needed to confirm our findings, this knowledge could potentially be useful for early detection of *E. coli* mastitis, and for decision-making regarding the initiation of pain-relief treatment during mastitis in dairy cows. This would improve animal welfare and potentially faster disease remission.

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To disbud but not to dock - is that our answer?

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Keywords: Disbudding, tail docking, pig, calves, ethics

Routine mutilations are common in production animals, often justified by a utilitarian approach¹. Based on two examples of these, we review whether societal debate is built upon scientific evidence. Most piglet tails are docked to limit tail-biting prevalence, and the majority of female dairy calves are disbudded to reduce alleged risks for human and animal safety².

Tail-docking is painful due to cutting of innervated tissue such as skin, muscles and bone, but pain relief is seldom administered. Among long-term consequences are neuroma formation and increased tail sensitivity^{3,4}. The consequences for pigs of not having a tail are not understood, but pig tails probably have a role in communication⁵.

At disbudding, growing horn tissue of young calves is removed, usually by a hot-iron, causing intense pain from 3rd degree burns⁶. In some countries pain relief is administered. The pain lasts for days, and persistent peripheral sensitisation of the area suggests long-term consequences⁷. The function of cattle horns, and especially consequences of living without horns, are not understood².

Both the efficacy of docking and consequences of not tail-docking are well-documented although tail-biting can be reduced by other means^{8,9}. In contrast, very little scientific documentation of potential consequences of keeping cattle with horns is available. At present, a stricter implementation of the tail-docking ban is a major focus within the EU. Contrarily, the societal debate on disbudding focuses on possibilities for pain relief, not on acceptability of the procedure as such. We are not aware of any scientific evidence to support this discrepancy.

REFERENCES

1. SANDØE P, CHRISTIANSEN SB, APPLEBY MC. 2003. Farm animal welfare: the interaction of ethical questions and animal welfare science. *Animal Welfare* 12: 469-478.
2. KNIERIM U, IRRGANG N, ROTH, BA. 2015. To be or not to be horned—Consequences in cattle. *Livestock Science* 179: 29-37.
3. HERSKIN MS, DI GIMINIANI P, THODBERG K. 2016. Effects of administration of a local anaesthetic and/or an NSAID and of docking length on the behaviour of piglets during 5 h after tail docking. *Research in Veterinary Science* 108: 60-67.
4. DI GIMINIANI P, EDWARDS SA, MALCOLM EM, LEACH MC, HERSKIN MS, SANDERCOCK DA. 2017. Characterization of short- and long-term mechanical sensitization following surgical tail amputation in pigs. *Scientific Reports* 7: 4827, DOI:10.1038/s41598-017-05404-y.
5. THODBERG K, HERSKIN MS, JENSEN T, JENSEN KH. 2018. The effect of docking length on the risk of tail biting, tail-directed behaviour, aggression and activity level of growing pigs kept under commercial conditions. *Animal* (in press).
6. ADCOCK SJJ, TUCKER CB. 2018. Painful procedures: when and what should we be measuring? In: *Advances in Cattle Welfare* <https://doi.org/10.1016/B978-0-08-100938-3.00008-5>.
7. CASONI D, MIRRA A, GUTZWILLER A, SPADAVECCHIA C. 2017. Persistent peripheral sensitization following disbudding in calves. *Proc of the Congress of the EFIC, Sept. 6-9, Copenhagen, Abstract number 376*.
8. LARSEN MLV, ANDERSEN H.M-L, PEDERSEN LJ. 2017. Which is the most preventive measure against tail damage in finisher pigs: tail docking, straw provision or lowered stocking density? *Animal* doi.org/10.1017/S175173111700249X

9. VALROS, A AND HEINONEN, M, 2015: Save the pig tail. *Porcine Health Management*. 2015, 1:2, DOI: 10.1186/2055-5660-1-2.

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EEG and Behavioural Changes for on-farm euthanasia of turkeys

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Keywords: Humane killing methods, slaughter, turkeys, sodium pentobarbitone, Koechner Euthanasia Device (KED)

Mechanical cervical dislocation of turkeys using the Koechner Euthanasia Device (KED) is a conditionally acceptable euthanasia method. There is interest in this device because it is inexpensive and easy to use; however, further work is needed to determine its ethical acceptability. The objective of this study was to evaluate electroencephalograph (EEG) and behavioural responses of two ages of turkeys euthanized with intravenous pentobarbital sodium (1mL/4.5kg) (the gold standard) or the KED.

Baseline EEG and behavioural measures were recorded in lightly anaesthetised birds (isoflurane in O₂ by face mask) and for 5 minutes following euthanasia method application using an ambulatory EEG system. Female and male turkeys 8 w.o.,(2.5kg) and 18 w.o.(19.4kg) respectively) were randomly allocated to barbiturate (n=6 female, n=5 male) or KED (n=12 female, n=10 male) treatments. Birds euthanised with pentobarbital IV

remained motionless and presented with isoelectric signals at 18±9.27s and 27±13.6s for females and males, respectively. For the KED, isoelectric signals occurred in only 6 females and 8 males with an average time to isoelectric signal of 277±58.1s and 218±58.1s, respectively. With the KED, the mean time to onset of clonic convulsions was 137±30.1s and 55.7±14s in young and older turkeys, respectively. Loss of eye reflexes occurred in all turkeys within 1 minute after barbiturate administration whereas they were only lost in 1 young and 4 mature turkeys with the KED before trial endpoint. Use of the KED for turkey euthanasia resulted in highly inconsistent onset of brain death and alternative euthanasia methods should be considered.

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Attitudes of slaughter industry personnel towards animal welfare

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Conflicts of interest: The authors declared there were none.

Keywords: Slaughter, welfare, attitudes, questionnaire, training

It has been widely reported that human attitudes towards animals can have a significant influence on human-animal interactions. In the slaughter industry, where individual people often handle and dispatch hundreds of animals daily, attitudes towards animals can have an important effect on animal welfare and product quality. This study was aimed at investigating attitudes of personnel working in the slaughter industry and the influences that gender, experience, role and previous welfare training may have on such attitudes. Between May 2017 and May 2018 all delegates attending the slaughter industry specific Animal Welfare Officer (AWO) and Poultry Welfare Officer (PWO) training courses run by the University of Bristol were invited to complete a questionnaire designed to collect both demographic and attitudinal information.

A preliminary analysis of 150 questionnaires was carried out using ordinal regression, Mann Whiney U-tests and Kruskal-Wallis tests. Female participants (n=43) had more positive views on animal welfare questions compared to male participants (n=102), however there were no differences in empathy scores between the genders. Those respondents with previous AWO/PWO training (n=44) felt there was 'greater value in animal welfare training' than those who had not previously attended the course (n=106). Respondents whose work was in an enforcement position (n=26) reported the greatest degree of emotional detachment from their role. However, a person's role did not significantly affect their empathy scores or views on animal welfare as assessed using the questionnaire. Time spent in the industry did not significantly influence any of the responses.

These preliminary findings suggest that gender has one of the most significant effects on attitudes of slaughter industry personnel towards animal welfare. It is interesting to note that none of the participants who handled animals on a daily basis was female, and the reasons for this may warrant further investigation. Having had previous welfare training positively influenced the perceived value of such training, suggesting that animal welfare training is viewed as a positive experience for personnel in the slaughter industry.

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Pre-slaughter cattle handling and stress in mobile slaughter

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Conflicts of interest: The authors declared there were none.

Keywords: mobile slaughter, on-farm slaughter, cattle, stress

On-farm slaughter may have the potential to limit animal stress. We studied animal handling at a mobile cattle slaughter plant housed in a truck trailer, comparing with a large-scale stationary plant. During one year, 596 cattle (50% at each plant) were observed at driving and in the stun box. In the mobile plant, animals were driven 2.4 to 5.7 m from an inspection pen to the stun box by farm or plant staff. The stationary driveway was 7.3 m long and the animals were handled by plant staff only. Penetrating captive bolt stunning was followed by hoisting and thoracic sticking.

Mean driving time was longer in animals that backed or turned around in the driveway compared to those that made an uninterrupted passage to the stun box (199 s vs. 54 s and 228 s vs. 132 s, respectively). In the mobile slaughter, mean time in the driving lane was longer in animals that were perceived as 'hesitant' compared to 'calm' before driving started (296 vs. 223 s), or were driven by farm staff compared to plant staff (239 vs 133 s). Mean (\pm SD) stun-to-stick time was 102 (\pm 30) s in the mobile slaughter and 44 (\pm 9) s in the stationary slaughter, and 10 and 2.7%, respectively, of the animals were re-shot.

This study shows the importance of calm pre-slaughter handling for efficient driving into the stun box. It also indicates that the requirements for effective stunning and sticking may be difficult to meet in a mobile slaughter unit, likely due to interior design constraints.

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The study was funded by the Marie-Claire Cronstedt Foundation and the Swedish Animal Welfare Association.

Welfare “triage” of broilers to find and counteract suffering

J. Cranley

Conflicts of Interest Statement: As an Official Veterinarian (OV) one’s primary duty is to protect the welfare of animals under one’s care, therefore there is no conflict of interest, in improving broiler welfare on arrival at abattoirs.

Keywords: broiler, abattoir, slaughter, ante-mortem suffering, injuries

INTRODUCTION

Official reliance on food chain information and previous Salmonella farm tests, deprives injured broilers of Official Veterinarian (OV) scrutiny, at abattoirs, which for other animals, guarantees protection after their ante-mortem inspection.

METHODOLOGY

Three broiler consignments of 3,500 were examined using ante-mortem triage over three separate days. Birds on their backs, or vocalising with feet trapped in the floor mesh holes, trapped birds with broken wings, broken legs, and birds with dislocations of hip joints, were triaged for the severity of suffering. The findings were recorded on video. Mirrors were used to see into the lower drawers. A rapid decision was made to avoid exacerbation of suffering, liaising with, and instructing, the animal welfare officer (AWO) to kill suffering birds immediately. Live birds found on their backs were moved to empty observation drawers, gently placed in a sitting position or killed humanely if their righting reflex was damaged. Where ambient temperature exceeded 7°C, the birds were offered a dish of water, and also to those showing signs of heat stress.

RESULTS

Dehydrated birds drank copious quantities of water. Thirst increased with time since the birds last had access to water on the farm. Injured birds were killed quickly and overcrowded drawers were thinned, and uninjured trapped birds were released.

CONCLUSIONS

Advising, the Animal Welfare Officer to reduce stocking density in the drawers by removing broilers gently from drawers, improved welfare for the remaining birds, as did rehydration. Opening and closing module drawers can trap or kill birds. The OV checking the front of the drawer in tandem with AWO at the rear, ensured any bird’s head was not at risk, and may avoid this problem.

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An observational study on tail biting in commercial Greek slaughterhouse

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Conflicts of interest: The author declared there were none. This study was undertaken through a Short Term Scientific Mission (STSM) funded by COST action CA15134 'Synergy for preventing damaging behaviour in group housed pigs and chicken' (grouphousenet.eu).

Keywords: pigs, tail biting, abattoir prevalence

Tail biting (TB) is a complex behavioural condition comprising one of the most common problems in the pig industry (1). The aim of this study was to define the incidence of TB in the Greek commercial barns. The assessment of pig welfare and occurrence of tail biting was done in a commercial slaughterhouse in Katerini, Greece. A total of 25 pig delivery was surveyed with a total of 461 finisher pigs which were assessed. The age of the pigs was 5.5-6.5 months with an average slaughter weight around 115 kg. The assessment was done on the slaughter line after exsanguination of the pigs and before the skin removal, by using a protocol based on scoring system: lesions of the skin of tail, ears, skin of front, middle and hindquarters and legs (2).

Our preliminary results demonstrated high incidence of skin lesions (74.18%), tail lesions (46.42%), hind limb bursitis (42.52%), ear skin

lesions (16.49%) and loin bruises (12.15%). Lower incidence rates were observed for tail length loss (1.52%), missing ear part (2.17%) and ear haematomas (1.73%).

REFERENCES

1. KRITAS, S.K. AND MORISSON, R.B. (2007). Relationship between tail biting in pigs and disease lesions and condemnations at slaughter : The Veterinary Record, 160, 149-152
2. VALROS, A., AHLSTROM, S., RINTALA, H., HAKKINEN, T., SALONIEMI, H. The prevalence of tail damage in slaughter pigs in Finland and associations to carcass condemnations. Acta Agric Scand Sect A-Anim Sci 2004;54:213-9

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Housing conditions influence perception of auditory communicative signals in horses

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Conflicts of interest: The authors declared there were none related to this project, in particular authors affiliations, research funders, memberships for all authors.

Keywords: Horses, auditory communication,

Housing conditions have been shown to influence horse behaviours but little is known about their effect on horse perception of auditory communicative signals. This research is aimed at measuring horse ability to detect emotional valence of auditory communicative signals and establishing if housing conditions influence this perception. Thirty-five horses (N=20 group-housed, N=15 single-housed) were individually exposed to two conditions. Condition 1 (10min in a horsebox) exposes horses to a 50-sec auditory stimulus (1-group member, 2-stranger conspecific whinnies playback in a 3-positive context-reunion or 4-negative context-separation, 5-non-biological pink noise) at random, one-day interval per stimulus). Behavioural data were head movements, head position, locomotion, vocalisations¹. In Condition 2 (5min. paddock choice test), horses heard simultaneously two playbacks (group members and opposite contexts or strangers and opposite contexts, at random), twice a day, for three days. Data were stimulus attractiveness (initial head orientation, body orientation, duration next to stimulus²). Wilcoxon, Fisher and Binomial tests were used according to variables and the significance level was 0.05.

In Condition 1, horses reacted more to the negative context playback but distinguished differently familiarity: group-housed horses reacted more to a group member playback whereas single-housed horses reacted more to the stranger playback. In Condition 2, group-housed horses were again

more attracted by negative context playbacks, without familiarity influence but single-housed horses behaviours were more ambiguous.

This work shows that housing conditions impact on horses interpretation of auditory communicative signals. As most horses are single-housed, research to improve their welfare should be a priority.

REFERENCES

1. ACCORDING TO BRIEFER EF, MANDEL R, MAIGROT AL, BRIEFER FREYMOND S, BACHMANN I, HILLMANN E (2017). Perception of emotional valence in horse whinnies. *Frontiers in Zoology*. 14, 8.
2. ACCORDING TO LEMASSON A, REMEUF K, HAUSBERGER M (2015). Tenseness relaxed by vocalizing, illustrated by horses (*Equus caballus*) whinnying. *Journal of Comparative Psychology*, 129(3), 311.

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Welfare of sheep in traditional and novel housing systems in Norway

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Keywords: sheep, housing systems,

During winter time, Norwegian sheep are commonly housed indoors. Confinement on slatted flooring in insulated buildings is most common, but one third of the Norwegian sheep population is now housed in non-insulated buildings of varying design. The aims of this study were: 1) to refine a protocol for on-farm welfare assessment of housed sheep and 2) to assess data collected from 64 Norwegian sheep flocks in order to explore how different housing systems are related to welfare outcomes. An on-farm welfare assessment protocol previously developed for housed sheep (1) was refined and further expanded to include Qualitative Behaviour Assessments (QBA) (2) and group observation methods (3). Prior to the lambing season, 64 farms were randomly selected for welfare assessments by five trained veterinary assessors. QBA was performed and signs of clinical disease including lameness, coughing and pruritus were assessed by

group observation. This was followed by clinical examination of individual sheep, sampled by random selection according to flock size. Resource-based measures including relative humidity, lighting and temperature were also systematically recorded on all farms.

The most commonly observed animal-based welfare outcomes were overgrown claws (29.9 %), callus on carpus (27.5%), dirt on the abdomen (18.8%) and wool loss (16.0%). Data analysis is on-going and will include multivariable regression models in order to investigate possible associations between different housing systems and measures of sheep health, welfare and production. To our knowledge, this is the largest study of Norwegian sheep welfare. Further results will be presented at the conference.

REFERENCES

1. STUBSJØEN, S.M., HEKTOEN, L., VALLE, P.S., JANCZAK, A.M. AND ZANELLA, A.J. (2011). Assessment of sheep welfare using on-farm registrations and performance data. *Animal Welfare* 20(2), pp. 239-252
2. MURI, K., STUBSJØEN, S.M. AND VALLE, P.S. (2013). Development and testing of an on-farm welfare assessment protocol for dairy goats. *Animal Welfare* 22(3), pp. 385-400.
3. PHYTHIAN, C.J., CRIPPS, P.J., MICHALOPOULOU, E., JONES, P.H., GROVE-WHITE, D., CLARKSON, M.J., WINTER, A.C., STUBBINGS, L.A., DUNCAN, J.S. (2012). Reliability of indicators of sheep welfare assessed by a group observation method. *The Veterinary Journal* 193(1), pp. 257-263.

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Survey on management and welfare of Livestock Guardian Dogs in twenty-seven sheep and goat farms in the Tuscan Emilian Apennine area

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Conflicts of interest: The authors declare that they have no competing interests.

Keywords: Guard sheep dogs, welfare, management, Tuscan Emilian Apennine, wolves

The recent expansion of wolf populations represents a serious challenge for managing human-carnivore conflicts. Livestock depredation is one of the most prevalent causes of antagonism¹. Sheep is the species most preyed upon by wolves, followed by cattle and goats²⁻⁵. Livestock guardian dogs (LGDs) are considered one of the most powerful prevention tools against carnivore depredation on livestock⁶⁻⁹. The aim of this study was to acquire information on how LGDs are managed in sheep and goat farms, focusing on signalment, health, management, education and behaviour of dogs. Data were collected by visiting 27 farms in Tuscan Emilian Apennine area and interviewing the farmers. 91 LGDs were included, with a mean of 1 dog every 25 livestock units. The most represented breed was the Maremma Sheepdog. 59% of dogs were vaccinated, 66% wormed and 92% treated for ectoparasites. Only 12% were neutered. Most farmers fed their dogs with pet food, but in 63% of cases dogs had access to afterbirths and livestock carcasses. Coprological examinations were positive for 15 farms out of 19, with Tricocephali, Cestodes and Ascarids. 37% of farmers had no previous experience with LGDs. The undesirable behaviours most frequently reported were aggressiveness to strangers, car chasing and lack of attentiveness to the flock.

This survey revealed that behavioural and management problems are mostly due to negligence during the dogs' socialisation period and, more generally, to training errors. Effective promotion of prevention measures, including LGDs, needs to be adequately supported by training and assisting livestock owners in their correct use¹⁰.

REFERENCES

1. THIRGOOD, S., WOODROFFE, R. AND RABINOWITZ, A. (2005). The impact of human-wildlife conflict on human lives and livelihoods. In: *People and Wildlife: Conflict or Co-existence?* Cambridge: Cambridge University Press, pp.13-26.
2. CIUCCI, P., BOITANI, L., FRANCISCI, F. AND ANDREOLI, G. (1997). Home range, activity and movements of a wolf pack in central Italy. *Journal of Zoology*, 243(4), pp.803-819.
3. FICO, R., MOROSETTI, G. AND GIOVANNINI, A. (1993). The impact of predators on livestock in the Abruzzo region of Italy. *Revue Scientifique et Technique de l'OIE*, 12(1), pp.39-50.
4. GAZZOLA, A., CAPITANI, C., MATTIOLI, L. AND APOLLONIO, M. (2008). Livestock damage and wolf presence. *Journal of Zoology*, 274(3), pp.261-269.
5. MERIGGI, A. AND LOVARI, S. (1996). A Review of Wolf Predation in Southern Europe: Does the Wolf Prefer Wild Prey to Livestock? *The Journal of Applied Ecology*, 33(6), pp.1561-1571.
6. ANDELT, W. (2004). Use of Livestock Guarding Animals to Reduce Predation on Livestock. *Sheep & Goat Research Journal*, 19, pp.72-75.
7. GEHRING, T., VERCAUTEREN, K. AND LANDRY, J. (2010). Livestock Protection Dogs in the 21st Century: Is an Ancient Tool Relevant to Modern Conservation Challenges? *BioScience*, 60(4), pp.299-308.
8. LESCUREUX, N. AND LINNELL, J. (2014). Warring brothers: The complex interactions between wolves (*Canis lupus*) and dogs (*Canis familiaris*) in a conservation context. *Biological Conservation*, 171, pp.232-245.
9. SHIVIK, J. (2006). Tools for the Edge: What's New for Conserving Carnivores. *BioScience*, 56(3), p.253.

10. MARINO, A., BRASCHI, C., RICCI, S., SALVATORI, V. AND CIUC-
CI, P. (2016). Ex post and insurance-based compensation fail to in-
crease tolerance for wolves in semi-agricultural landscapes of central
Italy. *European Journal of Wildlife Research*, 62(2), pp.227-240.

LITERATURE

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Towards an improvement of dairy donkey welfare: the development of good animal management practices guidelines

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Conflicts of interest: The project “Development of guidelines for dairy donkeys: good practice principles for sustainable donkey milk production” has received funding from The Donkey Sanctuary, Sidmouth, Devon, EX10 0NU, UK.

Keywords: donkey; welfare; guidelines; donkey milk

Donkey milk is a valuable product for babies suffering from multiple-allergies ¹⁻³ and cosmetic production; therefore new dairy donkey farms are opening around Europe. Little information is available for farmers on sustainable production of donkey milk, including animal welfare, milk production and processing ⁴⁻⁷. Targeted dissemination of information on appropriate animal management would assist dairy donkey farmers in preventing welfare problems. This research project aims to develop guidelines on good practice principles for sustainable donkey milk production.

Different steps were followed to develop the guidelines: identification of key issues for dairy donkey welfare, analysing the results of previous project ^{4,7-8} and the available scientific literature; systematic review research to select promising solutions for each issue included in the guidelines; stakeholder consultation, in order to increase scientific soundness and to enhance their acceptability throughout the sector; guidelines drafting and revisions by stakeholders; and guidelines launch. The guidelines “Dairy donkeys: good practice principles for sustainable donkey milk production” were launched in December 2017. They include suggestions derived from the scientific literature and/or reported by internationally

recognised experts. The guidelines provide clear and helpful advice on good animal management practices for anyone interested in donkey milk production. They comprise the following chapters: “Responsibilities”, “Feed and water”, “Housing and Management”, “Donkey health care”, “Humane killing”, “Appropriate behaviour” and “Milking procedures”.

The guidelines, translated in different languages and freely available online, are designed to provide clear and helpful advice on good animal management practices for anyone interested in sustainable donkey milk production.

REFERENCES

1. IACONO, G., CARROCIO, A., CAVATAIO, F., MONTALTO, G., SORESI, M., BALSAMO, V. 1992. Use of Ass Milk in Multiple Food Allergy. *J Pediatr Gastroenterol Nutr* 14, 177-181
2. CARROCCIO, A., CAVATAIO, F., MONTALTO, G., D'AMICO, D., ALABRESE, L., IACONO, G. 2000. Intolerance to hydrolysed cow's milk proteins in infants: clinical characteristics and dietary treatment. *Clin Exp Allergy*, 30, 1597-1603
3. MONTI, G., BERTINO, E., MURATORE, M. C., COSCIA, A., CRESI, F., SILVESTRO, L., FABRIS, C., FORTUNATO, D., GIUFFRIDA, M. G., CONTI, A., 2007. Efficacy of donkey's milk in treating highly problematic cow's milk allergic children: An in vivo and in vitro study. *Pediatr allergy Immunol*, 18, 258-264, doi:10.1111/j.1399-3038.2006.00521.x
4. DAI, F., SEGATI, G., BRSCIC, M., CHINCARINI, M., DALLA COSTA, E., FERRARI, L., BURDEN, F., JUDGE, A., MINERO, M., 2018. Effects of management practices on the welfare of dairy donkeys and risk factors associated with signs of hoof neglect. *J Dairy Res*, 85, 1, 30-38, doi:10.1017/S0022029917000723
5. GIACOMETTI, F., BARDASI, L., Merialdi, G., MORBARIGAZZI, M., FEDERICI, S., PIVA, S., SERRAINO, A., 2016. Shelf life of donkey milk subjected to different treatment and storage conditions. *J Dairy Sci*, 99, 6, 4291-4299, doi:10.3168/jds.2015-10741

6. ALTIERI, G., DI RENZO, C. G., GENOVESE, F., 2009. Preliminary Results Using a New Method To Optimize a Spray Dryer Process for Producing High Quality Milk Powder From Cow, Goat and She-Ass Milk Concentrates, 532, 35-41
7. DAI, F., SEGATI, G., DALLA COSTA, E., BURDEN, F., JUDGE, A., MINERO, M., 2017. Management practices and milk production in dairy donkey farms distributed over the Italian territory. *Maced Vet Rev*, 40, 2, i-iv, doi:10.1515/macvetrev-2017-0016
8. DAI, F., SEGATI, G., DALLA COSTA, E., BURDEN, F., JUDGE, A., CANALI, E., MINERO, M., 2017. Ensuring welfare on farm of donkeys kept for milk production: An analysis of the legislation. *Large Anim Rev*, 23, 59-64

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A program for the feral cat population control in Aoste, Italy

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Keywords: dog, aggression, shelter, evaluation, management, welfare

INTRODUCTION

The aim of this study is to develop a programme to address the feral cat population in Aosta, Italy. Feral cat colonies are registered and under the surveillance of local veterinary services for population control, according to Italian law 281/91 on pet animals and prevention of straying¹. Voluntary carers linked to non-profit associations look after feral cats not only giving the cats food and shelter, but also interacting with them socially.

MATERIALS AND METHODS

Feral cats from specific geographic areas captured for the population control program were trapped, sedated, and tested for feline viral infections. Healthy cats were neutered, dewormed, vaccinated, microchipped, and released to their area of origin. Cats affected by pathologies were transferred to the regional cat shelter. The cat shelter then assesses whether the cats can be introduced back into the colony, or are stray cats waiting for their owners' to claim, or can be re-homed, or have to be temporarily hospitalised for care or surgery.

RESULTS

In 2014-2017, the total number of cat colonies listed in the region was 850 for 74 municipalities and 1069 cats were neutered. Trap-neuter-release (TNR) programmes were used to decrease the population size. In the same period, 117 new cats entered the shelter, 8 were returned to their owners, 21 were reintroduced into their territory, 53 were re-homed and 36 died. The regional cat shelter currently keeps 50 cats.

DISCUSSION AND CONCLUSIONS

The results of this study highlight the positive effect of (1) monitoring the cat colonies and (2) the using a cat shelter for temporary care and rescue. When considering the management of feral cat populations, public health issues and the welfare of the cats themselves are major concerns that should be addressed.

Furthermore, a high impact of TNR combined with the adoption of socialised cats, as suggested by Levy and others² (2014), as well as providing an adequate education for people to prevent abandonment, are effective tools for reducing shelter cat intake.

The effectiveness of the trap-vasectomy-hysterectomy-release (TVHR) method versus TNR should be evaluated in near future. According to McCarthy and others (2013) TVHR is preferred over TNR for the management of feral cats populations when a decrease in population size is the goal³.

REFERENCES

1. NATOLI, E., MARAGLIANO, L., CARIOLA, G., FAINI A., BONANNO, R., FANTINI, C. (2010). Management of feral domestic cats in the urban environment of Rome (Italy). *Preventive Veterinary Medicine*, 77, pp. 180-185
2. LEVY, J.K., ISAZA, N.M., SCOTT, K.C. (2014). Effect of high-impact targeted trap-neuter-return and adoption of community cats on cat intake to a shelter. *The Veterinary Journal*, 201, pp. 269-274

3. MCCARTHY, R.J., LEVINE S.H., REED J.M. (2013). Estimation of effectiveness of three methods of feral cat population control by use of a simulation model. *Journal of the American Veterinary Medical Association*, 243(4), pp. 502-511

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Development of an observational quantitative temperament test in parrots

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Conflicts of interest: The authors declared there were none. This research has been accepted for publication in the *Journal Applied Animal Behaviour Science* and is available online.

Keywords: Parrots, temperament testing

Although temperament has been studied in a wide range of animal species¹, it has not yet been well documented in psittacids^{2,3}. Since parrots possess developed communicative and cognitive skills, the study of personality traits is of particular interest.

The aim of our study was to develop a reliable and valid temperament test by measuring quantitative behavioural parameters in two genera of medium-sized parrots: the African Grey Parrot (*Psittacus erithacus*, n=15) and the Amazon parrot (*Amazona* spp., n=16). We selected a set of 26 behavioural parameters based on a high intra-observer reliability.

A principal component analysis was used to establish two reliable and valid temperament traits: anxiety/vigilance and curiosity/neophilia. These traits allowed us to demonstrate differences in the temperament of two species from two different genera: Blue-Fronted Amazon Parrots were significantly more anxious/vigilant (U=148, N1=12, N2=15, p=0.027). We found that parrots were more curious/neophilic when the test was repeated after six weeks (84% of the scores were above the identity line), suggesting

that a brief exposure to the experimental conditions resulted in a process of habituation. However, a further test eighteen months after the initial test revealed a high consistency in the two temperament traits.

To our knowledge, this is the first report of an objective observational temperament test applied on two parrot species in order to compare temperament. We believe that comparison of different avian species' temperaments using similar testing procedures opens an interesting avenue of research which could be used to link temperament, phylogenetic and ecological data.

REFERENCES

1. RÉALE, D., READER, S.M., SOL, D., MCDUGALL, P.T., DINGEMANSE, N.J. (2007). Integrating animal temperament within ecology and evolution. *Biol. Rev.* 82, 291–318.
2. CUSSEN, V.A., MENCH, J.A. (2014). Personality predicts cognitive bias in captive psittacines, *Amazona amazonica*. *Anim. Behav.* 89, 123–130.
3. FOX, R.A., MILLAM, J.R. (2010). The use of ratings and direct behavioural observation to measure temperament traits in cockatiels (*Nymphicus hollandicus*): temperament measurement in cockatiels. *Ethology* 116, 59–75.

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From scientific evidence to horse welfare: Understanding barriers and drivers to implementation of optimal horse-care practices

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Keywords: horses, laminitis, owner management and care,

Laminitis is a debilitating foot disease that causes lameness and often requires prolonged treatment. It is considered to be a clinical syndrome associated with systemic disease or altered weight bearing rather than being a discrete disease entity. Three forms have been identified: Endocrinopathic, supporting-limb, and sepsis-associated.¹ In severe cases, the lamellae become unable to support the pedal bone causing it to sink and rotate within the hoof capsule, which can necessitate euthanasia. Endocrinopathic laminitis, associated with diseases such as equine metabolic syndrome and pituitary pars intermedia dysfunction, is the commonest form in the UK². The prevalence of laminitis in the UK among the general horse population is unknown, but studies have found the annual prevalence to range between 4.0-17.1%^{3,4} depending on the population studied. Aetiology for laminitis is well researched⁴⁻⁷, but it is unknown whether or how research evidence translates into changes in horse care and improved health. This mixed methods study aims to investigate horse carers' awareness of evidence-based best practices and to identify barriers and drivers affecting the implementation of research-based recommendations. Using laminitis as an exemplar for other important equine health and welfare issues, we will determine whether and how scientific evidence influences horse care.

In phase one of the study, UK horse carers (horse owners and equine yard owners or managers who make some primary decisions regarding the day-to-day care of horses) are being recruited via a range of methods including social media, equine magazines and internet forums to complete an online questionnaire. The questionnaire captures demographic information about the participant, their horses or yard, information-seeking behaviours, views on equine-focussed scientific research, and knowledge of laminitis risk-reducing husbandry practices, and whether or not they are being implemented. Descriptive analysis and univariable logistic regression has been conducted on the first three weeks of responses.

After 3 weeks, 804 complete responses had been received. In total, 707 (88%) of respondents were horse owners. Of the 98 (22%) running equine yards, 39 (40%) had a livery yard. Respondents were categorised as having horses of high, medium or low laminitis risk based on their answers to questions about breed (native or non-native) and previous disease diagnosis (laminitis, EMS or PPID). Two hundred (25%) respondents cared for horses that were categorised as low risk, 336 (42%) medium risk and 268 (33%) high risk.

Respondents reported gathering information about equine health care from a range of sources and those who had dealt with equine health issues had used a median of 2 or 3 sources (range 0-11) depending upon the subject. Initial information source varied by welfare topic: veterinarians for lameness (488 - 61%), feed companies for weight management (363, 45%) and websites for grazing management (245 - 30%). Views on scientific research varied. Although 431/801 (54%) believed research findings often contradicted themselves, only 29/800 (4%) felt research to be untrustworthy. Just over a third (283/798 - 35%) believed findings from research were often difficult to put into practice. The majority (573 - 72%) agreed that scientific research formed the basis of advice from vets and 623/800 (78%) thought it had had a positive impact on horse welfare. Horse carers reported as practising the standard laminitis prevention recommendations: routine foot care (636 - 79%), maintaining an ideal body weight (618 - 77%) and feeding a balanced diet (611 - 76%), however only 233 (29%) reported avoiding turning horses out on a bright, frosty morning and 132 (16%) reporting using grazing muzzles. Horse carers with 'high risk' horses had 5.7 times the odds (95% CI 3.8-8.6, $p < 0.001$) of practising restricted grazing and 5.6 times the odds (95% CI 2.9-11.0, $p < 0.001$) of using a

grazing muzzle compared to those with 'low risk' horses.

Initial findings suggest that the majority of horse carers recognise that scientific research plays an important role in the health and welfare of their horses. They access a number of different information sources, but prefer to seek a perceived expert initially depending on the issue at hand. Carers responsible for horses at a higher risk of developing laminitis were more likely to undertake risk-reducing measures, suggesting that they may be more aware of recommended practices or perceive them to have a greater benefit than carers responsible for 'low risk' horses.

Final questionnaire findings will be used to inform the design of the second phase of the study: a qualitative, interview-based investigation of horse carers' barriers to and drivers for acceptance of research evidence and implementation of best practices. The ultimate aim is to improve horse health and welfare by mitigating barriers to best practice and optimising communication between researchers and horse carers.

REFERENCES

1. PATTERSON-KANE JC, KARIKOSKI NP, MCGOWAN CM. Paradigm shifts in understanding equine laminitis. *Veterinary journal* (London, England : 1997) 2018;231:33-40.
2. GEOR RJ. Pasture-associated laminitis. *Veterinary Clinics of North America, Equine Practice* 2009;25:39-50.
3. MENZIES-GOW NJ, KATZ LM, BARKER KJ, ET AL. Epidemiological study of pasture-associated laminitis and concurrent risk factors in the South of England. *Veterinary Journal* 2010;167:690-4.
4. MENZIES-GOW NJ, HARRIS PA, ELLIOTT J. Prospective cohort study evaluating risk factors for the development of pasture-associated laminitis in the United Kingdom. *Equine veterinary journal* 2017;49:300-6.
5. LUTHERSSON N, MANNFALK M, PARKIN TDH, HARRIS P. Laminitis: Risk Factors and Outcome in a Group of Danish Horses. *Journal of Equine Veterinary Science* 2017;53:68-73.

6. WYLIE CE, COLLINS SN, VERHEYEN KL, NEWTON JR. RISK factors for equine laminitis: a case-control study conducted in veterinary-registered horses and ponies in Great Britain between 2009 and 2011. *The Veterinary Journal* 2013;198:57-69.
7. WYLIE CE, COLLINS SN, VERHEYEN KLP, NEWTON JR. Risk factors for equine laminitis: A systematic review with quality appraisal of published evidence. *The Veterinary Journal* 2012;193:58-66.

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Do animals need play and if yes – can owners be a sufficient partner? Implications and consequences for animal welfare

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Play is a phenomenon reported across many species; covering fish, birds and many mammals (Burghardt, 2005). Despite centuries of research the function of play is still not clearly understood. Indeed, different types of play may serve different functions varying across species, environment, age and social status (Sommerville et al., 2017). Among companion animals, dogs are unique in that playful interactions are regularly initiated and performed not only as juveniles but also as adults, with play levels remaining high throughout their lives (Bekhoff, 1972).

Intraspecific play appears to be structurally different from interspecific play in dogs, having different motivations and serving different goals (Bradshaw et al., 2015). For example, object play with a human counterpart has been reported to be more collaborative (e.g. dogs surrendering toys to prolong the play session) when compared to dog-dog play (Rooney et al., 2000).

Most importantly, during play sessions hormones in the stress and reward system are secreted and play with humans was reported to reduce cortisol levels in dogs (Horvath et al. 2008). Hence, it is not surprising that there is evidence that playful activities can strengthen the human dog relationship when eliciting a positive affective state in both parts of the human animal dyad (Horowitz and Hecht, 2016).

This also explains why play can be used as a reinforcer for training in dogs. It is also known that arousing and emotional situations improve cognitive performance and memory of events. It is thought that beta-adrenergic activation and the release of specific stress hormones enhance memory consolidation and lead to an increase in remembering through facilitation of memory recall (McGaugh, 2000).

This has been shown in humans, non-human primates, rodents and most recently in dogs (Affenzeller et al., 2017). It was demonstrated that training performance after 24 hours can be enhanced in Labrador Retriever dogs engaged in 30 minutes of playful activities (going for a walk and object play) with a human experimenter immediately after acquiring a 2-choice object discrimination task when compared with allowing dogs to rest post-training. A year later dogs were then re-trained based on their previous object and group allocation, until training criterion was met again (success rate $\geq 80\%$ in two consecutive sessions). To avoid a location and experimenter bias all dogs were re-tested in a different room and re-trained by two different experimenters.

Playful activities for 30 minutes post-learning affect long-term memory not only after 24 hours (Affenzeller et al., 2017) but also one year later. Errors made in Session 1 and 2 were significantly affected by the type of intervention ($p=0.021$ $F=7.73$, DF 1, 10). Dogs from the playful activities group ($n=5$) made significantly fewer errors in training sessions 1 and 2 than dogs from the resting group (mean number of errors playful activities group: 3.6, SD 2.1, resting group: 6.5, SD 1.4, 2 sample t -test: $t(6)=-2.6$ $p=0.037$, effect size $d=1.6$). To the author's knowledge this is the first evidence that play does not only serve as an immediate reinforcer during dog training but can also be used strategically as a post-training activity to positively influence memory in dogs.

However, it needs pointing out that the "play style" of dog handlers has the potential to elicit a contrasting effect on salivary cortisol levels in dogs. It has been shown that disciplinary behaviour and a more command like play style resulted in a significant increase in dog cortisol. In contrast, more affiliative and affectionate behaviour significantly decreased circulating cortisol levels (Horvath et al., 2008).

In conclusion social human–dog play has the potential to increase familiarity between play partners, to strengthen the dog owner relationship, to be used as an immediate reinforcer in training but is also having a potent memory enhancing effect when used strategically after training sessions.

From a welfare perspective, a better understanding of efficacious positive interventions and effects of "play styles" in different training tasks would be of tremendous practical use both in the professional and the private sector of dog training.

REFERENCES

1. AFFENZELLER, N., PALME, R., & ZULCH, H. (2017). Playful activity post-learning improves training performance in Labrador Retriever dogs (*Canis lupus familiaris*). *Physiology & behavior*, 168, 62-73.
2. BEKOFF, M. (1972). The development of social interaction, play, and metacommunication in mammals: an ethological perspective. *The Quarterly Review of Biology*, 47(4), 412-434.
3. BRADSHAW, J. W., PULLEN, A. J., & ROONEY, N. J. (2015). Why do adult dogs 'play'? *Behavioural processes*, 110, 82-87.
4. BURGHARDT, G. M. (2005). *The genesis of animal play: Testing the limits*. Mit Press.
5. HOROWITZ, A., & HECHT, J. (2016). Examining dog–human play: the characteristics, affect, and vocalizations of a unique interspecific interaction. *Animal cognition*, 19(4), 779-788.
6. HORVÁTH, Z., IGYÁRTÓ, B. Z., MAGYAR, A., & MIKLÓSI, Á. (2007). Three different coping styles in police dogs exposed to a short-term challenge. *Hormones and behavior*, 52(5), 621-630.
7. MCGAUGH, J. L. (2000). Memory--a century of consolidation. *Science*, 287(5451), 248-251.
8. ROONEY, N. J., BRADSHAW, J. W., & ROBINSON, I. H. (2000). A comparison of dog–dog and dog–human play behaviour. *Applied Animal Behaviour Science*, 66(3), 235-248.
9. SOMMERVILLE, R., O'CONNOR, E. A., & ASHER, L. (2017). WHY do dogs play? Function and welfare implications of play in the domestic dog. *Applied Animal Behaviour Science*, 197, 1-8.

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Changing human behaviour to bring about positive changes in animal welfare, with a focus on farm animal welfare

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The welfare of managed animals is intimately affected by the behaviour of their keepers and other humans who interact with them. These impacts can occur indirectly (e.g. our decisions about the management, housing, feeding and social contact we may allow our pets or farmed animals) or directly (e.g. through our direct contact with animals and the nature and severity of any interactions). Thus, understanding what influences human behaviour, and the decision-making that occurs in our interactions with animals, are fundamental to bringing about practical changes in animal welfare. In psychology research the factors affecting human behaviour have been studied for many years, and the complex interplay of different factors that affect decision-making explored through various frameworks. These have been applied to a variety of situations, including health behaviours, environmental issues and, more recently, animal welfare situations. In this paper what is known about how different attitudes, beliefs, barriers and motivations can affect willingness to change practices will be considered from an animal welfare perspective, particularly focusing on farmed livestock. In addition, different initiatives which have been successful in bringing about changes in farm animal welfare practice will be discussed.

One of the most commonly used theories underpinning human behaviour is the Theory of Planned Behaviour (Ajzen, 1991), which suggests that behaviour derives from intention and that intention is influenced by attitudes, subjective norms (e.g. habits; accepted practices within a social group), and perceived behavioural control. These three factors are influenced by beliefs. Other studies modify this model by including such factors

personality variables (such as compliance), practical issues (such as perceptions of usefulness or ease of use) and the influence of peers and social factors.

In common with others, farmers are rational and make decisions based on what is important to them, their family and their production system. Whereas some farmers may only just achieve the minimum standards in animal welfare, others may farm in ways that provide significantly higher animal welfare. Understanding how and why some farmers provide a much higher standard of animal welfare can be beneficial in developing strategies to improve uptake of voluntary animal welfare policies or other improvements. Veterinarians are considered as 'trusted advisors' by many farmers, and have the opportunity to be influential in effecting welfare change. Thus an improved understanding of the complexity of on farm decision-making can help to make interactions between farmers and vets (or between vets and other animal keepers) more effective.

It is often assumed that farmers will be 'profit-maximisers' in how they choose to manage their farms (Edwards-Jones, 2006), that is, that farm management should be designed to achieve the highest productivity and the greatest profit from the available land or resources. Real or perceived costs and the potential for production loss inevitably form part of the barriers to bring about changes in animal welfare interacting with the potential monetary benefit of making changes. Thus, although frequently not the main issue, efforts to bring about welfare changes need to take into consideration the impact on farm productivity and profitability. However, there is evidence that veterinarians tend to over-emphasise the importance of financial factors and productivity in farmers decisions, whereas farmers also consider practical issues, effectiveness and animal welfare as important drivers in their choices (Hambelton & Gibson, 2017). These may be more important for some farmers than others, for example, farmers largely supplying markets focusing on price and production (e.g. supermarkets selling low cost food), will be more concerned about physical aspects of welfare (health, growth etc) and the impact on production than farmers supplying markets with a focus on more quality attributes, such as animal welfare or sustainability (van Huik et al., 2007).

Policy-makers and educationalists often assume that the barriers to change are related to lack of awareness or lack of knowledge. In some

cases this can be true: for example if farmers believe that some procedures (e.g. dehorning or tail docking) do not cause pain, or that it is short lived, then they are less likely to consider pain relief to be very important or relevant to their system (Weary et al., 2016). However, although knowledge is important, there are often a very significant number of other barriers to change which can often be practical issues: e.g. lack of time to make changes, inflexibility of the existing infrastructure, difficulties in sourcing bedding materials, inability to deal with changes in waste products, lack of time or lack of labour etc. Thus although a farmer may be interested in making animal welfare changes, and may be able to achieve productivity gains by these actions, the real or perceived difficulties in achieving the required change may still prevent changes from occurring.

It is also well-known in social science studies of human behaviour change that routine habits and practices can be very hard to alter, and may act as barriers to implementation of improvement in animal welfare, as in other areas (e.g. energy use, Owens & Driffill, 2008). In UK 58% of farmers are over 55, and similar figures occur in other European countries. In addition, farms often pass down through families with the same land being farmed for generations, with each generation being taught by the previous. These practices may be embedded into the farm management and reflect deep-rooted assumptions, beliefs and attitudes. In studies of other farming attributes older farmers are considered to be less likely to bring about management change, whereas younger farmers, or those that are more educated, are more willing to adopt new practices or new technologies (e.g. Ahnstrom et al., 2008). Practices are more likely to be adopted in all cases if there is a clear benefit of the change that is suggested, and this is communicated in a way that makes sense to the recipient of the information.

Farmers may also make decision based on their emotional response to an issue, on whether they felt pressure from peers or family members to change and because they felt pride in the health or appearance of their herd or flock (Palczynski et al., 2016; Leach et al., 2010). Farmers who felt helpless in the face of a health issue (e.g. lameness in sheep) were less likely to believe that they were able to make a change than those that had different emotional responses when faced with health issues (O'Kane et al., 2017). Where farmers felt there was little societal concern about an issue (e.g. mulesing in sheep in Australia, Wells et al., 2011) they reported

little desire to make a change but acknowledged that they would change practice if there was greater social pressure and they felt consumers were likely to view their industry more negatively. In addition, even when farmers can understand and recognise the scale of a welfare problem when, for example, asked to rate the condition, this may not be consistent with their perception of the issue on their own farm (Palczynski et al., 2016). Exposure to their own on farm conditions, in this case plumage loss in chickens, can lead to normalisation of what is acceptable. In these situations outside perceptions, perhaps from other farmers, can help to shift these norms.

Research has shown that an important component of animal welfare, and livestock productivity, is the quality of the human-animal relationship (Hemsworth, 2003). In particular, fear of humans can be an important animal welfare issue in livestock production, and a potent inhibitor of animal production. This suggests that animal welfare, but also animal productivity, can be constrained by the motivation, attitudes and actions of the farm staff. The stockperson can improve the welfare of the animals in his/her care by their technical skills and knowledge, their motivation, attitudes and beliefs about animals, and their job satisfaction, which all impact on how they respond to livestock, and in turn how the animal reacts to them. Specific training on husbandry practices, for example on low stress animal handling and movement, can improve both animal welfare and animal productivity. This can address gaps in technical skills, but has also been shown to improve attitudes to animals and hence the behaviour of the stockperson towards the animals in their care.

A number of projects or practical approaches have considered in bringing about positive changes. Engaging farmers and producers at all stages in a project to develop welfare interventions or assessments can be an important means for educating all parties involved and to develop a more holistic understanding of the problem (Van Dijk et al., 2017). By involving animal producers directly in research projects to develop new knowledge for animal welfare science, new opportunities to share different types of knowledge can be created. This approach recognises and values the knowledge that the stockperson may have about his/her animals, and creates 'buy-in' with the project outcomes. Often research into farm animal welfare may be carried out remotely from those that may be subsequently required to implement the outcomes. This can then be viewed with suspicion if the rationale for any suggested changes are not fully explained. By involving

all stakeholders as participants in the work from the very beginning then end-users become invested in the work, and can see how changes are tested and new evidence gathered and validated.

Studies that have made use of bench-marking – where farms are able to compare their data with those of other farms – are in response to the known effects of peer pressure and pride in having healthy stock or a well run farm. These have been reported to have been received favourably by participants (Sumner et al., 2018) and facilitating access to own and pooled data helped farmers to identify areas that required work themselves. In addition, farmers are often more willing to learn from peer-to-peer learning, where they can see the impact of best practice for themselves, than from more theoretical discussions on welfare outcomes. Focusing on achievable targets, in a number of key areas, has also been shown to be beneficial in bringing about sustained improvements in practices (Vasseur et al., 2010), particularly when participants were able to evaluate the advice and their farms performance.

In UK and Europe recent moves have been towards using welfare outcomes (animal-based assessment measures) to assess welfare on farm rather than relying on resource-based measures (which assess the risks to poor welfare). These can be advantageous, as they assess animal welfare in ways that can often make sense to the farmer as they mirror what they do in assessing their stock rather than applying a ‘tick-box’ exercise. However, these may also present some challenges, as farmers may not perceive the value of some measures, there may be a conflict with the farmers role in caring for their animals, and disagreements between assessors and farmers on measures used in welfare outcomes (van Dijk et al., 2018). The responses of farmers to these schemes can be affected by their beliefs and how the evidence is presented, but have been shown to be useful in improving awareness of animal welfare and particular issues (Dwane et al., 2013). As discussed above, where farmers are involved in the process from the start, and contribute to the development and evaluation of an assessment scheme this can be beneficial in acting as a learning opportunity for what measures are important for animal welfare.

Farmers may decide to implement animal welfare changes for a variety of reasons, which include productivity and profitability but are considerably more complex than these drivers. In order to bring about welfare change

we need to understand the complexity of decision-making, and the multiple drivers that may prevent farmers from making positive changes, even if they understand the welfare issues, and can see that these will be associated with improved productivity. Methods that address these many drivers, such as what is the normal on farm practice, how readily practical changes can be made, what peers think or other social pressures which may have a bearing on changes in practice and how engaged farmers are by the welfare issue, and the potential solution, will be more likely to be taken up to influence animal welfare.

REFERENCES

1. AHNSTROM, J., HOCKERT, J., BERGEA, H.L., FRANCIS, C.A., SKELTON, P., HALLGREN, L. (2008). Farmers and nature conservation: What is known about attitudes, context factors, and actions affecting conservation? *Renewable Agriculture and Food System*, 24, 38-47.
2. AJZEN, I (1991) The Theory of Planned Behaviour. *Organisational Behaviour and Human Decision Processes* 50, 179-211.
3. DWANE, AM., MORE, SJ., BLAKE, M., MCKENZIE, K. (2013) Farmers' self-reported perceptions and behavioural impacts of a welfare scheme for suckler beef cattle in Ireland. *Irish Veterinary Journal* 66, Article Number: 1.
4. EDWARDS-JONES, G. (2006) Modelling farmer decision-making: concepts, progress and challenges. *Animal Science* 82, 783-790.
5. HAMBELTON & GIBSON, (2017) Study investigating the attitudes and opinions of cattle farmers and veterinarians in the UK on the use of non-steroidal anti-inflammatory drugs (NSAIDs) for post-disbudding analgesia of calves. *Animal Welfare* 26, 322-333.
6. HEMSWORTH, P.J. (2003) Human-animal interactions in livestock production. *Applied Animal Behaviour Science* 81, 185-191.
7. LEACH, KA., WHAY, HR., MAGGS, CM., BARKER, ZE., PAUL, ES., BELL, AK., MAIN, DCJ. (2010) Working towards a reduction in cattle lameness: 1. Understanding barriers to lameness control on dairy farms. *Research in Veterinary Science* 89, 311-317.
8. O'KANE, H., FERGUSON, E., KALER, J., GREEN, L. (2017) Associations between sheep farmer attitudes, beliefs, emotions and personality, and their barriers to uptake of best practice: The example of footrot. *Preventive Veterinary Medicine* 139, 123-133

9. OWENS, S. & DRIFFILL, L. (2008) How to change attitudes and behaviour in the context of energy. *Energy Policy* 36, 4412-4418.
10. PALCZYNSKI, L.J., BULLER, H., LAMBTON, S.L., WEEKS, C.A. (2016) Farmer attitudes to injurious pecking in laying hens and to potential control strategies. *Animal Welfare* 25, 29-38.
11. SUMNER, C.L., VON KEYSERLINGK, M.A.G., WEARY, D.M. (2018) How benchmarking motivates farmers to improve dairy calf management. *Journal of Dairy Science* 101, 3323-3333.
12. VAN DIJK, L., HAYTON, A., MAIN, D.C.J., BOOTH, A., KING, A., BARRETT, D.C., BULLER, H.J., REYHER, K.K. (2017) Participatory Policy Making by Dairy Producers to Reduce Anti-Microbial use on Farms. *Zoonoses & Public Health* 64, 476-484.
13. VAN DIJK, L., ELWES, S., MAIN, D.C.J., MULLAN, S.M., JAMIESON, J. (2018) Farmer perspectives on welfare outcome assessment: learnings from four farm assurance scheme consultation exercises. *Animal Welfare* 27, 1-11.
14. VAN HUIK, M.M., BOCK, B.B. (2007) Attitudes of Dutch pig farmers towards animal welfare. *British Food Journal* 109, 879-890.
15. VASSEUR, E., RUSHEN, J., DE PASSILLE, A.M., LEFEBVRE, D., PELLERIN, D. (2010) An advisory tool to improve management practices affecting calf and heifer welfare on dairy farms. *Journal of Dairy Science* 93, 4414-4426.
16. WEARY, D.M., VENTURA, B.A., VON KEYSERLINGK, M.A.G. (2016) Societal views and animal welfare science: understanding why the modified cage may fail and other stories. *Animal* 10, 309-317
17. WELLS, A.E.D., SNEDDON, J., LEE, J.A., BLACHE, D. (2011) Farmer's Response to Societal Concerns About Farm Animal Welfare: The Case of Mulesing. *Journal of Agricultural and Environmental Ethics* 24, 645-658

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Insight into human-animal-dyads – current research on who is influencing whom and how this is connected to animal welfare

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Humans are very often the main social partners of pets and their widespread presence in human environments has implications for human safety, animal welfare, and in general the health of both parties (Payne et al., 2015).

In dogs, it has been shown that the nature of the dog human relationship can have an important impact on quality of life for both dog and owner (Julius et al., 2012), and on the risk of relinquishment (Patronek et al., 1996). Certain training- and interaction styles can be associated with problematic behaviours such as aggression toward people and conspecifics (Arhant et al., 2010).

Formal training, however, is only one way how people interact with dogs, potentially also being influenced by a social desirability bias (e.g. people behave in a way that is viewed favourable by others).

Therefore, the way in which owners spontaneously interact and communicate in everyday life situations might provide a more valuable insight into the human animal dyad and in identifying factors that might impact on this entity. Most often questionnaire-based measures of the relationship between owner and dog as perceived by the owner have been used so far, with standardized behaviour settings and observation protocols mostly missing.

Recently, a new behavioural testing procedure was developed to comprehensively characterize how owners interact with their dogs using a battery of tasks such as playing with a ball, tug of war, restraint while putting a T-shirt on, taking a saliva sample, and greeting behaviour upon reunion after separation (Cimarelli et al., 2017). Exploratory Factor Analysis of 20 different variables measured revealed three main factors: Owner Warmth, Owner Social support and Owner Control (Cimarelli et al., 2016). This bottom-up approach has highlighted that dog owners interaction styles are similar to those identified in human parents (Kuppens et al., 2013). The existence of parenting styles (i.e. strategies of parents to raise their children) in the owner dog- relationship has been examined adapting a questionnaire originally developed for the analysis of human parenting. Herwijnen and colleagues (2018) identified similar (but not completely overlapping) styles in dog owners who were questioned on their ways of interacting with their dogs. In particular, they distinguished an authoritarian-correction orientated style from an authoritative- intrinsic value orientated style and an authoritative-training based style. The authors postulated that the authoritarian- correction orientated style might be driven by a more extrinsic coercive view, whereas the two authoritative styles might be driven by a more intrinsic protectionistic and humanistic view. Importantly, in children supportive vs. overprotective parenting lead to different behavioural outcomes. For example, the authoritative parenting style is known to optimise children outcomes such as high academic performance and high self-reliance/esteem levels (Wing Chan and Koo, 2011).

In dogs, it has been shown that the owner interaction style factors are indeed associated with their dog's behaviour. For example, it has been shown that dogs of warmer owners rely more on their owners when they face a social stressful situation (i.e. a person approaching them in a threatening way). This is in contrast to dogs of colder owners who actively approach the potential danger either aggressively or in an appeasing way, highlighting the role of the owner in a dog's coping strategy (i.e. to deal autonomously with the problem or to let the owner deal with it), factors which are highly relevant when undertaking a risk assessment of problematic/dangerous behaviours for cases seen by a behaviour professional.

It has already been shown that dogs are capable of social referencing by synchronizing their approach tendencies based on their owner's direction of movement towards a stranger (Merola et al. 2012, Durantón et al. 2016),

pointing out the importance of owners to manage their dogs behaviour through adapting their own behaviour; an integral part of a behaviour treatment plan.

This raises the question if more desirable and/or preventative parenting styles in dogs exist, and if so, can they be used effectively to prevent the development (or to become an intervention target in the treatment) of certain behaviour problems?

Taking into account owners interaction style in a behavioural treatment plan, and if necessary intervene in order to optimize it, is possible: the personality of the owner seems to only partially explain how owners behave towards their dogs (Cimarelli et al. 2016), with other elements such as culture, training, attitudes and experience playing another important role.

Data on cats and interaction styles of their owners with them is scarce. A recent correlational study on risk factors for urinary house soiling in cats (one of the main reasons for relinquishment to an animal shelter) also questioned owners about the perceived bond of their cats to them. Most interestingly with a perceived "strong dependence on its owner" latrine related problems were less common, whereas with an "affectionate bond" were reported to be more common. In addition, a tendency to describe the cat as having a relaxed personality was associated with a lower risk of marking behaviour whereas being described by the owner as very demanding for attention, nervous, easily frustrated, moody, or aggressive (including specific aggressive behaviour to either humans or other cats) were not associated with an increased risk of house soiling (Barcelos et al., 2018). What is the relationship of owner attitudes towards certain behaviour problems, what are the effects of owner and pet personality and interaction style and how does it affect the bond between owners and their pets? Do certain behavioural traits mitigate against rejection from the home and does the human animal bond or interaction style have protective effects against the development of certain behaviour problems?

Future research is needed to explore whether and how owner interaction styles in daily life situations influence animal behaviour in general but also how this might impact on welfare, quality of life and the development of behaviour problems like fear or aggression.

REFERENCES

1. ARHANT, C., BUBNA-LITTITZ, H., BARTELS, A., FUTSCHIK, A., & TROXLER, J. (2010). Behaviour of smaller and larger dogs: effects of training methods, inconsistency of owner behaviour and level of engagement in activities with the dog. *Applied Animal Behaviour Science*, 123(3), 131-142.
2. BARCELOS, A. M., MCPEAKE, K., AFFENZELLER, N., & MILLS, D. S. (2018). Common risk factors for urinary house soiling (periuria) in cats and its differentiation: the sensitivity and specificity of common diagnostic signs. *Frontiers in veterinary science*, 5.
3. CHAN, T. W., & KOO, A. (2010). Parenting style and youth outcomes in the UK. *European sociological review*, 27(3), 385-399.
4. CIMARELLI, G., TURCSÁN, B., BÁNLAKI, Z., RANGE, F., & VIRÁNYI, Z. (2016). Dog Owners' Interaction Styles: Their Components and Associations with Reactions of Pet Dogs to a Social Threat. *Frontiers in Psychology*, 7-1979. <https://doi.org/10.3389/fpsyg.2016.01979>
5. CIMARELLI, G., TURCSÁN, B., RANGE, F., & VIRÁNYI, Z. (2017). The other end of the leash: an experimental test to analyze how owners interact with their pet dogs. *Journal of visualized experiments: JoVE*, (128).
6. DURANTON, C., BEDOSSA, T., & GAUNET, F. (2016). When facing an unfamiliar person, pet dogs present social referencing based on their owners' direction of movement alone. *Animal behaviour*, 113, 147-156.
7. JULIUS, H., BEETZ, A., KOTRSCHAL, K., TURNER, D., & UVNÄS-MOBERG, K. (2012). *Attachment to pets*. New York: Hogrefe.
8. KUPPENS, S., LAURENT, L., HEYVAERT, M., & ONGHENA, P. (2013). Associations between parental psychological control and relational aggression in children and adolescents: A multilevel and sequential meta-analysis. *Developmental Psychology*, 49(9), 1697.
9. MEROLA, I., PRATO-PREVIDE, E., & MARSHALL-PESCINI, S. (2012). Social referencing in dog-owner dyads? *Animal Cognition*, 15(2), 175-185. <https://doi.org/10.1007/s10071-011-0443-0>
10. PAYNE, E., BENNETT, P. C., & MCGREEVY, P. D. (2015). Current perspectives on attachment and bonding in the dog-human dyad. *Psychology research and behavior management*, 8, 71.
11. VAN HERWIJNEN, I. R., VAN DER BORG, J. A., NAGUIB, M., & BEERDA, B. (2018). The existence of parenting styles in the owner-dog relationship. *PLoS one*, 13(2), e0193471.

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Do animals need their mothers?

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Maternal care is expressed towards offspring by a wide variety of animal species: mammals, birds, some species of reptiles, fish and even some insects. In mammals, care of the offspring is exclusively carried out by the mother in the majority of species (only about 3% of mammals show paternal care), whereas in birds paternal care is shown by about 90% of species. For both mammals and birds, those species which have been domesticated all show exclusively maternal behaviour. Maternal care provides the offspring with warmth, nutrition, immunological and physical protection, comfort, security, and opportunities for social learning. This is fundamental for the immediate and long term survival of even precocious offspring without alternative support. For example, our work shows that newborn lambs which do not suckle quickly after birth have impaired survival on the day of birth, and throughout lactation. However, in many domesticated animals, our management frequently involves separation of mothers and their young at earlier ages than these species would naturally wean their own offspring. At its most extreme we separate dairy animals from their young within a few hours of birth, or hatch poultry entirely without their mothers, and varying degrees of early weaning is common in all domesticated species. But if we ensure that the neonatal mammal has adequate colostrum and provide the newly weaned young animal with suitable food, warmth and protection from predators, does it matter that these animals are not cared for by their mothers? Are the other attributes of maternal care: comfort, security and opportunities to learn, also important for the development of the young animal?

Early studies of maternal attachment by Harlow in the 1960s addressed some of these questions in primates. His group showed that when monkey infants were provided with two surrogate mothers, one a wire frame which

provided milk and the other a softer more lifelike model, the infants fed from the wire frame surrogate, but spent the rest of the time in contact with the more lifelike model. This suggested that they required something more from their 'mother' than just nutrition. Similarly, more recent studies with dairy calves (Johnsen et al., 2015) have shown that calves which were managed with their mothers, but prevented from suckling and fed from a milk feeder, spent equivalent amounts of time in contact with their mother as calves that were allowed to suckle. Thus it seems that mothers represent more to their offspring than just a source of food. This maternal contact is also shown to be important to the offspring. Dairy calves that were separated from their mothers showed equivalent negative responses in tests of cognitive function (judgement bias tests) as calves that had experienced dehorning (Daros et al., 2014). Calves without their mothers also shown less social abilities, took longer to integrate into the herd and were more fearful than dam-raised offspring (LeNeindre & Sourd, 1984), and grew more slowly than calves raised with their mothers, even if prevented from suckling (Krohn et al., 1999). It seems, therefore, that mothers provide their offspring with many other attributes in addition to nutrition.

Young animals learn from their mothers by observational learning, and through early life exposure to novelty with this 'secure base' encourages exploration and interaction with the environment. This can help the young animal overcome neophobia and plays an important role in the development of food preferences, learning social signals and 'cultural' information (e.g. tool use in chimpanzees has been passed from mothers to offspring), and in preference for particular social partners. In our own work with sheep, we have observed differences in a number of behaviour patterns and social behaviours between different breeds of sheep. Using embryo transfer between these breeds we were able to separate maternal influences from genetic effects in these breed specific 'cultures'. Our work showed that maternal breed influences the patterns of suckling behaviour expressed by neonatal lambs, although play behaviour was more affected by lamb, rather than dam, breed (Dwyer & Lawrence, 1999). We have also shown that mothers train their offspring to recognise species-specific social signals, such as alert and alarm postures. Mother ewes use these signals to encourage the lamb to approach and suck, and refuse suckling attempts by the lamb which have not been preceded by these signals (Pickup & Dwyer, 2011). Before the lamb is weaned, much of its social behaviour – resting and activity patterns, social contacts and habitat

use are dictated by their mothers. Lambs maintain a close spatial proximity to their mothers where they mimic her behaviour, and after weaning they continue to express the same social and grazing preferences of their mothers, rather than of their own breed (Dwyer & Lawrence, 2000). This maternally-derived social behaviour was demonstrated more dramatically by studies which used cross-fostering to create lambs raised by goat mothers, and kids raised by ewes (Kendrick et al., 2001). Although lambs were raised in the company of other lambs, their play and affiliative social behaviours resembled those of their foster mothers, rather than their own species. As adults their sexual preferences were also for the species of the mother – goat-reared ewes preferred bucks, and ewe-reared does preferred rams. Over time, and continual exposure to adults of their own species, these sexual preferences waned in females, until they responded to courtship by males of their own species, but males exclusively courted females of the same species as their mothers.

These results represent interesting biological phenomena, but do they have any practical relevance? By appreciating the wider impact of maternal care on offspring development are we able to enhance the training or development and welfare of domesticated animals? For species that are weaned relatively late (e.g. sheep, beef cattle, horses) we may be able to make use of the training and stress buffering effects of prolonged maternal contact to facilitate learning about the post-weaning environment. For animals that have short or no maternal contact we may be able to provide more aspects of maternal care in the rearing environment to promote better welfare and an improved early life experience.

Mothers are known to be more influential as demonstrators or teachers than any other animal. Although many animals can learn by observation, offspring are in closer proximity to their mothers, and pay more attention to her behaviour than to any other individual. Studies in horses have shown that mares which have been habituated to novel objects are able to transmit their learning to their foals, which show lesser fearfulness when subsequently exposed to these objects (Christensen et al., 2016). Mothers already pass on knowledge about the environment, food and water sources and other aspects of learning, particularly in animals with a matrilineal social structure. By training the mothers in a flock or herd, could we transmit learning more effectively about shelter use, movement patterns through handling systems or exposure to different feeds to make animal

management less stressful to animals and their keepers? There is also evidence from rodent models, poultry, and ruminants that the presence of the mother can reduce stress reactivity, and mothers modulate their behaviour depending on the stress or pain that their neonates are experiencing (Edgar et al., 2015; Futro et al., 2015). In addition, cues that are associated with the mother, such as odour, can help young animals cope with post-weaning stressful events (Oostindjer et al., 2011). These studies suggest that stressful events in an animal's life can be reduced through exposure in the presence of the mother, which can help to mitigate some of the impact of these early life events.

For animals that experience early separation from their mothers, use of environmental features that provide some aspects of the comfort and security the young animal might experience with the mother have been shown to be associated with better behavioural responses in adulthood. For example, young chicks spend a lot of early life hidden under the body of their mothers where it is dark and secure. Using dark brooders, which provide a similarly dark and secure space for young poultry, has been shown to produce chicks which are less fearful, less aggressive, more sociable and less likely to develop feather pecking in adulthood (Gilani et al., 2012). Alternatively, access of these early separated animals to an adult surrogate figure, such as a nurse cow for dairy calves, may help the young animal learn appropriate social behaviours and recognise social cues which will provide better integration into adult social groups. As some countries, and some consumers, are starting to demand that young dairy animals have a better early life, with more social contact, the optimal period of social contact, and what characteristics are required for a surrogate are starting to be explored.

In sum, it is clear that mothers provide their offspring with significantly more than food and immunological protection, and that early life separation can have a lifelong detrimental impact on the function of the animal. We could make better use of either the presence of maternal contact, or maternal cues, in the early rearing of young domesticated animals which would benefit their welfare, and may also improve productivity for farm animals and improve trainability and handling in all domesticated animals.

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an assessment protocol dealing with different
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Zoos and aquariums often offer animal-visitor interactions. In recent years, awareness of the controversial aspects connected with these experiences has increased due to cultural changes. We suggest a six-step protocol evaluating the quality of interactions, by assessing animal welfare and maximising educational impact. Behavioural and physiological analyses and a risk assessment procedure are used to assess animal welfare, whereas questionnaires explore visitors' attitudes and educational effectiveness of their experiences. Results obtained are filled into an ethics matrix, which provides a rational ethics analysis of all the aspects involved, including all the stakeholders and underlining the potential conflicts of values. The final step of the protocol is to award red or yellow alerts to the interactions that need more attention and a green light to the ones that are already well monitored.

We tested a pilot version of the protocol in a zoo in Italy on animal-visitors interactions that involved tortoises. Behavioural data analysis showed that the tortoises were less inactive (i.e., basking + inactive lying or standing) during interaction days than during control ones (Mann/Whitney test: $p=0.015$). Risk assessment during the interaction has not revealed any critical issue, whereas questionnaires delivered to 179 visitors and

analysed with a Kano Model showed that touching animals was not a must for respondents, even if 53% of them appreciated it. Interaction participants were more likely than non-participants to subscribe to a conservation mailing-list (Fisher's exact-test $p=0.0322$). We are processing the final evaluation of the protocol. The results appear to be promising.

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Qualitative behavioural assessment of sheep is associated with the farmer's intrinsic work motivation

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Keywords: human-animal relationship, qualitative behavioural assessment (QBA), sheep welfare, stockmanship, work motivation

To ensure high standards of farm animal welfare, we need dedicated farmers who treat their animals considerately. A number of studies have provided evidence for a relationship between a stockperson's attitudes and behaviour, and the subsequent behavioural response of farm animals. However, research into the role of other individual characteristics of a stockperson in relation to animal welfare is scarce. In the Norwegian sheep industry (mean flock size: 72 ewes), the human-animal relationship is of particular importance due to the long indoor housing period during the cold season. The aim of this part of the SheepHouse project was to identify characteristics of farmers that were associated with sheep welfare.

A questionnaire (QuestBack™) was distributed to 3764 Norwegian sheep farmers (response rate 32%, N = 1206), and included psychometric scales to assess the farmers' job satisfaction, behavioural attitudes and work motivation, as well as structural variables and sheep health. Sheep welfare was subsequently assessed in 64 of these farms using an on-farm welfare assessment protocol, including qualitative behavioural assessments (QBA).

The psychometric scales and the QBA-data were analysed using principal-component analyses (PCA). Preliminary regression models indicate a strong and positive relationship between the first QBA-component (ranging from fearful, uneasy and vigilant to calm, content and trustful) and the farmers' intrinsic work motivation (i.e. valuing animal welfare, a meaningful job and the lifestyle of farming) ($P < 0.001$), explaining 24% of the variance. The results provide new insight into individual characteristics of stockpersons that may be of relevance for farm animal welfare.

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Welfare assessment with Welfare Quality® protocol and white blood cells evaluation in broiler flocks from different management systems

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Conflicts of interest: The authors declared there were none
Keywords: broiler, Welfare Quality, organic, management, H/L ratios, white blood cells, on farm welfare assessment

INTRODUCTION

Animal welfare is a major issue in the production of food of animal origin. There is increasing scientific evidence that farm animal welfare is not only an ethical issue, but could also be related to food quality and safety. It is often claimed that different management systems, organic in particular, could differently impact on animal welfare, but no studies are available in the scientific literature measuring the welfare of broiler chicken in these different contexts, according to scientifically recognised animal-based and resource-based indicators.

MATERIALS AND METHODS

In this study, part of a wider research project on the relationships between animal welfare and microbial contamination of meat [1], animal welfare was assessed in broiler chicken flocks from different farming systems, including organic, using a slightly modified Welfare Quality® (WQ) protocol for

Poultry [2]. In addition, heterophil-lymphocyte ratios (H/L) and total white blood cell counts (TWBC) were measured as long-term welfare indicators, as reported in a series of papers published during the 1980s [3,4] and later quoted in EFSA opinions on the welfare of broiler [5,6]. In particular, chronic increases in corticosterone in blood would reduce the number of lymphocytes and, therefore, increase the H/L ratio. Eleven broiler flocks (ranging from 5,973 to 19,773 individuals) from an integrated Italian poultry company were evaluated on-farm with WQ the day before slaughter. The age of the flocks ranged from 42 to 54 days old, except for organic that were slaughtered at 82 days old. Blood samples were randomly taken at the slaughterhouse from eight flocks out of eleven (72.7%) for the evaluation of H/L and TWBC.

RESULTS AND DISCUSSION

Fourteen animal-based indicators (“criteria”) referring to the four WQ principles (Good Feeding, Good Housing, Good Health, Appropriate Behaviour) were assessed. Flocks clustered into two groups in relation to the mean general score (166.2 ± 52.9): “lower welfare” (LW) and “higher welfare” (HW). As organic flocks showed welfare scores sharply over the mean (237.4 ± 18.0), a third group was created: “organic” (O). This included flocks from organic farms, managed according to European Union legislation (regulations EC 834/2007 and 889/2008), that requires for poultry production a number of animal welfare-friendly obligations, including much lower stocking density and access to open air areas for at least one third of their life. Both HW and O groups showed “excellent” Good Feeding (89.7 ± 7.0 and 101.3 ± 1.7 respectively), while LW flocks were only “acceptable” (43.7 ± 19.6). The other three Welfare Quality principles averaged lower scores. In fact, only the O group was very close to “enhanced” for both Good Housing (47.4 ± 2.8) and Good Health (49.3 ± 1.3), while LW groups were just over “acceptable”, particularly for Good Housing (20.5 ± 23.4). Appropriate Behaviour was never more than “acceptable” in all groups, with organic flocks showed values sharply higher than others (39.4 ± 12.1 in O, versus 21.6 ± 1.49 in LW and 19.9 ± 4.3 in HW). H/L ratios and TWBC did not statistically differ among the three groups (Kruskal-Wallis test, $p > 0.05$), mean values ranging from 0.86 to 1.46 and from 9,743/ μ l to 19,453/ μ l, respectively; in all cases, values were inside physiological ranges, slightly lower in O groups.

A COMMENT ON H/L VALUES

Collectively, these observation could let us rethink about the application of white blood cell evaluation for measuring long-term stress in broilers, in the farming systems currently used. According to Gross & Siegel, H/L reference values of 0.55 ± 0.27 for a “stable” chicken and 3 ± 2.7 for a “highly stressed” chicken [3], all the animals that we tested should be considered as mildly stressed, independently of the type of management. In our study, white blood cell evaluation was applied on farms under real production conditions, while data previously collected were usually in laboratory conditions, birds often being caged. In fact, most stressors to which broilers are subjected on farm would not be the same applied to animals tested in a laboratory. On the other hand, the WQ protocol seemed to be more sensitive in detecting differences between various broiler farming systems, organic and non-organic in particular. More studies could be useful to test the efficacy of white blood cell evaluation as an animal-based indicator of stress in broilers in the intensive farming conditions currently in place.

CONCLUSION

Overall, in our research, organic flocks showed better welfare according to WQ indicators, in particular sharp differences were highlighted mostly for Good Housing and Appropriate Behaviour principles. These data will be used to compare WQ indicators associated with microbiological contamination of carcasses (*Campylobacter* and *Salmonella*) measured in the same flocks at slaughterhouse, to investigate possible correlations. The final aim is to give to poultry companies new, animal welfare friendly tools to comply with compulsory microbiological criteria in meat production.

REFERENCES

1. IANNETTI, L., NERI, D., SANTARELLI, G.A., MARFOGLIA, C., D'ANGELANTONIO, D., DI SERAFINO, G., POMILIO, F., AND MESSORI, S. (2017). Effects of on-farm and pre-slaughtering stress on poultry meat contamination from *Campylobacter* spp. and other foodborne pathogens: preliminary results. In IAFP's Symposium on Food Safety, Brussels (Belgium). IAFP, P2-17.
2. WELFARE QUALITY® (2009). Welfare Quality® assessment protocol for poultry (broilers, laying hens). Welfare Quality® Consortium, Lelystad, Netherlands.
3. GROSS, W.B., AND SIEGEL H.S. (1983). Evaluation of the heterophil/lymphocyte ratio as a measure of stress in chickens. *Avian Diseases*, 27, pp. 972-979.
4. MAXWELL, M.H., ROBERTSON, G.W., ANDERSON, I.A., DICK, L.A., AND LYNCH, M. (1991). Haematology and histopathology of seven-week-old broilers after early food restriction. *Research in Veterinary Science*, 50, pp. 290-297.
5. EUROPEAN COMMISSION (2000). Report of the Scientific Committee on Animal Health and Animal Welfare: The Welfare of Chickens Kept for Meat Production (Broilers). Available from <https://ec.europa.eu/food/sites/food/files/safety/docs/sci-com_scah_out39_en.pdf> [Accessed 13 June 2018].
6. EUROPEAN FOOD SAFETY AUTHORITY (EFSA) (2012). Scientific Opinion on the use of animal-based measures to assess welfare of broilers. *EFSA Journal*, 10, pp. 2774-2848.

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Agony breeding – people's perception of breed-related welfare problems in Germany

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Conflicts of interest: The authors declared none

Keywords: dog breeding, agony breeding, public survey

The perception of breed-related welfare problems by people is fundamental to improve dogs' wellbeing. Dogs whose inherited disorders are considered to be perfectly normal for the breed will mainly not be judged as an 'agony'(1) breed. Our study was aimed at assessing how humans judge dog breeds with different inherited conformation-related defects. A web-based survey was posted on different social media to address people with and without dog experience. The survey was designed as a multiple-choice questionnaire and collected the following data: demographic characteristics: dog ownership, familiarity with dogs, knowledge about agony breeding, and legislation.

A final sample size of 538 questionnaires was analysed. Multiple regression analysis revealed an influence of dog ownership, participants' age and gender on their agony breeding-specific knowledge. A total of 15.43% of the participants have or had owned a dog of a brachycephalic breed (e.g. Pug, French Bulldog). Owners of brachycephalic dogs were mainly females ($F_{1,6} = 7.94$, $P = 0.005$) and elderly adults ($F_{4,4} = 4.57$, $P = 0.001$). The participants who were familiar with the term 'agony breeding' characterised the features of dwarfism ($F_{1,2} = 5.29$, $P = 0.022$) and short nose

($F_{1,3} = 18.50$, $P = 0.000$) significantly more often as signs of agony breeding. Independently of participants' age and gender, the English Bulldog, the Dachshund, and the Chinese Crested Dog, and independently of their experience with dogs, participants indicated the Pug, the Dachshund, and the Chinese Crested Dog as agony breeds. The discrepancy between people's knowledge and their decision about a breed will be presented.

EDITOR'S FOOTNOTE

1. Agony breeding: The practice of breeding animals in a way that fosters or tolerates characteristics that cause animals pain, agony, etc

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French veterinary practitioners and animal abuse: a survey

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Conflicts of interest: The authors declared there were none
Keywords: Veterinary practitioners, animal abuse

Veterinarians are faced with different forms of animal abuse. In English speaking countries (UK, USA, Australia), some studies have been conducted in order to determine the types of abuse veterinarians are confronted with, the frequency of the cases, and the way practitioners react to them (1-3). However, no study has been conducted in France. The authors carried out a survey in order to investigate the situation in France

An online questionnaire was developed, pre-tested, and a pilot study was conducted. The questionnaire was sent twice to a representative sample of 1,586 practising veterinarians.

The response rate was 14.4%. Statistical analysis was conducted using Chi square test. 93% of the respondents felt that they had a role to play in the detection and prevention of animal abuse. All of them had encountered cases of neglect; the frequency of neglect varied between 4.6 and 18.9% of the consultations. 88% of the respondents had been faced with physical abuse, the frequency of which was between 0.4 to 1.4% of the consultations. Psychological abuse was reported by 75% of veterinarians and sexual abuse by 11%. The more veterinarians had been faced with animal abuse, the more they felt involved in the fight against it (statistically significant difference, $p < 0.001$).

Almost all veterinarians felt they had a moral duty to take action but they did not know the law regarding confidentiality.

REFERENCES

1. KOGAN, L.R., SCHOENFELD-TACHER, R.M., HELLYER P. W., RISHNIW, M., AND RUCH-GALLIC, R. A. (2017) Survey of attitudes toward and experiences with animal abuse encounters in a convenience sample of US veterinarians, *J. Am. Vet. Med. Association*, 250 (6), 688-696
2. MUNRO, R. AND MUNRO, H. (2008) *Animal abuse and unlawful killing*. Saunders Elsevier: Edinburgh and London, 124p
3. GREEN, P. C. AND GULLONE E. (2005) Knowledge and attitudes of Australian veterinarians to animal abuse and human interpersonal violence. *Aust. Vet. J.*, 83 (10), 619-25

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Roar! Intraspecies aggression in a captive lion (Panthera leo), blending animal welfare, ethics and behavioural medicine

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Conflicts of interest: The author declared there were none.

Keywords: lions, Panthera leo, zoos, intra-species aggression, behaviour

CASE HISTORY

A male captive lion seriously injured a lioness which resulted in her euthanasia. Her two remaining littermates were separated from the lion and an EBVS® European Veterinary Specialist in Behavioural Medicine was consulted. The lions had been acquired from different sources and deemed otherwise healthy by the Zoo Veterinarian. A state of the art purpose built enclosure was built to maximise their natural behaviour and welfare. Treatment was instigated with fluoxetine and gabapentin for the male lion and fluoxetine for the lionesses who were suffering from pathological anxiety. The lions are now living together in harmony.

DISCUSSION

Mental health problems in humans and animals are linked to neurochemical imbalances in the brain and other pathology not evident at a gross anatomic level, and should be treated to preserve welfare^{1,2}. However, the use of psychoactive medication in animals³, particularly zoo animals is seen by some as controversial, and as a result some zoos are reluc-

tant to use psychoactive medication when indicated. However, I argue that all mammals (including wild mammals in the wild) can suffer from mental health disorders and all zoo animals should receive adequate health care and that they should be treated when indicated for any illness whether it is physical or mental. Failure to treat zoo animals when treatment is indicated is a serious ethical and animal welfare concern.

REFERENCES

1. AMERICAN PSYCHIATRIC ASSOCIATION, 2013. Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub.
2. OVERALL, K., 2013. Manual of Clinical Behavioral Medicine for Dogs and Cats. Elsevier Health Sciences.
3. JONCKHEER-SHEEHY, VSM. (2013). Using medication to treat animals with behaviour disorders: what all pet owners should know! [online]. Available at: <http://www.animalytics.nl/content/2013/08/Using-medication-to-treat-animals-with-behaviour-disorders-what-all-pet-owners-should-know> [Accessed 27 Feb. 2018].

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A critical review of the literature about the link between human and animal abuse

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Conflicts of interest: The authors declared there were none

Keywords: Human abuse, animal abuse, human-animal interactions

Many papers have shown correlations between animal and human abuse (1) (2) (3), which led the scientific community to accept the existence of a link (4) (5) (6) (7) (8) (9) between the two. However, no systematic review of these papers and only very few critical reviews (10) have ever been published. This study is a critical review of the literature in order to assess the quality of evidence and highlight the current conclusions that can be drawn.

Three meta-analysis of observational studies, 60 observational studies (13 case-control studies, 5 cohort studies, 42 cross-sectional studies), and 14 literature reviews published between 1983 and 2018 have been analysed. Many studies have fallacies and evidence about the link is incomplete and heterogeneous. The reason partly lies in the difficulty of the study of the subject. The research questions and the methods of study should be synchronised in order to improve the quality of the papers and to make it possible to draw conclusions about the link and its nature.

REFERENCES

1. CURRIE CL. 2006. Animal cruelty by children exposed to domestic violence. *Child Abuse Negl.* Apr;30(4):425–35.
2. VOLANT AM, JOHNSON JA, GULLONE E, COLEMAN GJ. 2008. The Relationship Between Domestic Violence and Animal Abuse: An Australian Study. *J Interpers Violence.* Feb 28;23(9):1277–95.
3. MERZ-PEREZ L, HEIDE KM, SILVERMAN IJ. 2001. Childhood Cruelty to Animals and Subsequent Violence against Humans. *Int J Offender Ther Comp Criminol.* Oct;45(5):556–73.
4. ARKOW P. 1992. The correlations between cruelty to animals and child abuse and the implications for veterinary medicine. *Can Vet J Rev Veterinaire Can.* Aug;33(8):518–21.
5. FLYNN CP. 2000. Why Family Professionals Can No Longer Ignore Violence Toward Animals*. *Fam Relat.* Jan;49(1):87–95.
6. BECKER F, FRENCH L. 2004. Making the links: child abuse, animal cruelty and domestic violence. *Child Abuse Rev.* Nov;13(6):399–414.
7. HOLOYDA BJ, NEWMAN WJ. 2016. Childhood animal cruelty, bestiality, and the link to adult interpersonal violence. *Int J Law Psychiatry.* Jul;47:129–35.
8. PATTERSON-KANE EG, PIPER H. 2009. Animal Abuse as a Sentinel for Human Violence: A Critique. *J Soc Issues.* Sep;65(3):589–614.
9. MCPHEDRAN S. 2009. A review of the evidence for associations between empathy, violence, and animal cruelty. *Aggress Violent Behav.* Jan;14(1):1–4.
10. BEIRNE P. 2004. From Animal Abuse to Interhuman Violence? A Critical Review of the Progression Thesis. *Soc Anim.* Mar 1;12(1):39–65.

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Professional confidentiality versus the reporting of abuse in France: legal and ethical analysis

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Conflicts of interest: The author declared there was none
Keywords: reporting animal abuse, France, law, ethics, professional ethics

Animal abuse is a very important societal issue and is, at least in its most severe forms, unlawful in occidental countries (1). It is of utmost importance to detect animal abuse and to change perpetrators' behaviour in order for abuse to decrease. Veterinarians are expected to be at the forefront of the fight against animal abuse. However, they are obliged to respect client confidentiality and thus are faced with an ethical conflict between confidentiality and reporting animal abuse.

The legislation regarding animal abuse in France as well as the case law will be presented (2,3). Professional secrecy is almost absolute and only in some restrictive cases are veterinarians allowed to report abuse. They are never obliged to report abuse, except in cases of imminent, certain and severe physical danger for people (4). The recent law regarding veterinary public health remains unclear, and in the absence of current jurisprudence, practising veterinarians do not know whether they are allowed to report cases of animals in danger or not (5).

Thus, veterinarians in France are constantly faced with difficult ethical decisions. The ethical reasons for secrecy will be presented; confidentiality protects animals and clients, makes it possible for veterinarians to carry out accurate diagnosis and treatment, and is of public interest (2). Abuse cases are always difficult and linked with human misery. Examples will be given, comparisons with other countries will be made and improvements will be suggested (6).

REFERENCES

1. MUNRO, R. AND MUNRO, H. (2008) Animal abuse and unlawful killing. Saunders Elsevier: Edinburgh and London, 124p
2. REMY, D. (2017) Le secret professionnel, *Le Point Vétérinaire*, 376, 6-7
3. REMY, D. (2017) Le secret professionnel : ce que renferment les textes de loi pour les vétérinaires, *Le Point Vétérinaire*, 377, 6-8
4. REMY, D. (2017) LE SECRET PROFESSIONNEL : quand le rompre ?, *Le Point Vétérinaire*, 378, 10-11
5. REMY, D. (2017) Secret professionnel et autorités judiciaires : quelques éléments d'analyse éthique, *Le Point Vétérinaire*, 381, 6-7
6. REMY, D. (2017) Le secret professionnel : discussion et extrapolation à partir d'un cas clinique, *Le Point Vétérinaire*, 380, 6-7

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On Materia Medica and Meridians – Should European Veterinary Regulators embrace or ban the practice of Traditional Chinese Medicine?

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Keywords: Traditional Chinese medicine, animal treatment, complementary medicine, alternative medicine, policy, acupuncture

Within the last few decades, complementary and alternative medicines (CAM) have gained increased popularity in the veterinary field. Several textbooks have exposed the scientific fallacies and historical misconceptions used to justify some of these therapies^{1,2} but these efforts have not succeeded in detaching veterinary practitioners from embracing them. Above all, Traditional Chinese Medicine (TCM), including acupuncture³, has emerged as the main alternative to conventional veterinary medicine.

The practice of veterinary TCM poses several ethical issues, namely the interests of animals, environmental concerns, professional conflicts and reputation. In the face of TCM, veterinary regulators are confronted with an ethical conundrum: to ban TCM on the grounds that is not based on sound scientific principles would hamper innovation and jeopardise the

use of widespread conventional treatments that are also not based on robust scientific evidence (e.g. joint mobility supplements). On the other hand, embracing TCM could open the door to other alternative therapies that also claim to possess scientific underpinning such as homeopathy^{4,5}.

In this presentation, the authors suggest a structured approach to considering CAM in the veterinary context, using TCM as a model, in order to support policy decision-making amongst European veterinary regulators. The authors conclude that irrespective of the effectiveness of TCM, regulatory bodies should restrict their use only to veterinarians so as to maintain professional control on their use. Moreover, safeguarding the role of the veterinary profession requires a combination of pedagogical approaches, including life-long learning opportunities in both scientific and ethical decision-making, history of veterinary medicine and critical thinking.

REFERENCES

1. GOUGH, A. AND TAYLOR, N., (2017). NO WAY TO TREAT A FRIEND: Lifting the Lid on Complementary and Alternative Veterinary Medicine, 5m Publishing, Portland.
2. RAMEY, D.M. AND ROLLIN, B.E., (2003). Complementary and Alternative Veterinary Medicine Considered. Wiley-Blackwell.
3. KLIDE, A.M. AND KUNG, S.H. (2002). Veterinary Acupuncture. University of Pennsylvania Press.
4. LEES, P., PELLIGAND, L., WHITING, M., CHAMBERS, D., TOUTAIN, P.-L. AND WHITEHEAD, M.L. (2017A). Comparison of veterinary drugs and veterinary homeopathy: part 1. *Veterinary Record* 181, 170–176.
5. LEES, P., PELLIGAND, L., WHITING, M., CHAMBERS, D., TOUTAIN, P.-L. AND WHITEHEAD, M.L. (2017B). Comparison of veterinary drugs and veterinary homeopathy: part 2. *Veterinary Record* 181, 198–207.

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Associations of caretaker attitudes with alpaca behaviour

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Conflicts of interest: The authors declared they have none. The study was self-funded.

Keywords: Animal caretaker, attitudes, alpaca, behaviour

Human attitudes influence human and in turn animal behaviour, as shown in different animal species. Such links have never been investigated in alpacas. Via an online-survey, caretakers were asked about general attitudes towards alpacas (agreement to attributes, e.g., 'alpacas are intelligent'), affective attitudes (degree of comfort felt in different situations with the animals), behavioural beliefs (inquiring e.g., if walking through the group is important), and the animals' behaviour and ease of handling. Sample size varied since no answers were mandatory.

Principal component analyses helped reducing variables to factors, e.g., 'general positive attitude', 'degree of comfort during routine work', 'importance of walking through groups of animals', 'ease of handling during leading/driving'. Attitudes, beliefs, and alpaca behaviour were significantly related. Respondents with more positive general attitudes felt more comfortable during routine work with alpacas ($r_s=0.40$, $P<0.001$, $N=135$). People who felt more comfortable during routine work rated walking through groups as more important ($r_s=0.34$, $P<0.001$, $N=143$) and reported their alpacas to be easier to handle during leading/driving as well as during restraint for shearing and nail clipping ($r_s=0.24/0.23$, $P<0.01$, $N=143/144$).

Respondents who reported that the majority of their animals approached them had a more positive general attitude and found it more important to walk through groups than caretakers who reported that the majority of alpacas would stand still or run away when being approached (Mann-Whitney U tests: $P < 0.05$).

Relationships between attitudes, beliefs, and animal behaviour found in other species were confirmed in this study, which could help to improve the human-animal relationship.

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A qualitative study of children's attitudes in regard with animal captivity in zoos

J. Gaillard, D. Remy

Conflicts of interest: the authors declared there were none
Keywords: Zoos, children, education, animal sentience, captivity

Although children are the main visitors to zoos, almost no study has been carried out about the influence of their visit on their attitude towards animal captivity. This research question is addressed in this study. It is of utmost importance as some authors think that being faced with animal captivity could adversely affect the education for animal sentience as well as the development of empathy for animals (1) (2).

A preliminary study was carried out in order to optimise the materials and the methods. A qualitative study was conducted using semi-directed interviews on 27 children aged between eight and ten and approached during their visit of the Barben zoo in France. Interviews were all recorded and a thematic analysis was carried out.

The results showed that most children saw the visit as an ordinary family activity; all except one took animal captivity for granted. The exchanges children had with family members were mostly superficial and information panels were not or only rarely read. 21 children were convinced captivity protected the animals from the dangers of freedom. For three children, animals were captive for leisure purposes exclusively. Only three children, who had all been educated by family members, knew about endangered species and the role of zoos in conservation.

In conclusion, children's education on zoos does not seem to enhance awareness about animal sentience and the issue of animal captivity. Suggestions to improve this education are given.

REFERENCES

1. SERVAIS, V. (2012). La visite au zoo et l'apprentissage de la distinction humaine. [online]. *Revue d'anthropologie des connaissances*, Vol 6 n°3, pp. 625-652.
2. AVAILABLE AT: <https://www.cairn.info/revue-anthropologie-des-connaissances-2012-3-page-625.htm> [accessed: 01.06.2017]
3. CYRULNIK, B., DE FONTENAY, É., SINGER, P., MATIGNON, K. L AND ROSANE, D. (2013). *Les animaux aussi ont des droits*. Paris : Éditions du Seuil, 268 p.

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A qualitative study of animal welfare inspectors' moral stress in France

M. Martin, D. Remy

Conflicts of interest: The authors declared there were none
Keywords: animal welfare, inspector, moral stress

Detecting animal abuse and caring for the animal victims are societal issues [1]. The professionals who deal with these issues are subject to moral stress, as are all professions faced with violence. However, although some studies about moral stress in animal health care workers have been published [2] [3], there is, to the authors' knowledge, no paper about moral stress in animal welfare inspectors. In order to fill this gap, the authors carried out a qualitative study amongst animal welfare inspectors in France. In this country, they do not belong to police forces and have no punitive power.

12 semi-directive interviews were carried out on animal welfare inspectors belonging to charities recognised to be of public interest. Interviews were recorded and transcribed verbatim. A thematic analysis of all interviews was conducted.

Preliminary results show that animal welfare inspectors in France are particularly frustrated as they have no possibility of access into private properties unless accompanied by police officers; thus they cannot gather the evidence that is necessary for police to get involved. For some inspectors, frustration leads to anger with the system. Some inspectors break the law in order to gather evidence and protect animals. Almost all inspectors insisted on the necessity to distance themselves from the cases they investigated.

In conclusion, animal welfare inspectors suffer from moral stress in France. Policy makers should take this result into account to enable inspectors to overcome frustration and promote human behaviour change. Suggestions will be given in order to improve the situation.

REFERENCES

1. TIPLADY, C. (2013) Animal abuse: helping animals and people. 1st edn. Oxfordshire : CAB International
2. POLACHEK, A. AND WALLACE, J., (2017) 'The paradox of compassionate work: a mixed-methods study of satisfying and fatiguing experiences of animal health care providers', *Anxiety, Stress, & Coping*, 31(2) p 228-243
3. COHEN, S.P. (2007) 'Compassion fatigue and the veterinary health team', *Veterinary Clinics of North America: Small Animal Practice*, 37(1) p 123-134

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Is an Attention Deficit Hyperactivity Disorder (ADHD) rating scale modified for use in dogs useful for discriminating between a Hypersensitivity-Hyperactivity (HSHA) population and healthy matched controls?

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Conflicts of interest: The authors declared there were none
Keywords: Dogs, Attention Deficit Hyperactivity Disorder (ADHD), Hypersensitivity-Hyperactivity (HSHA) syndrome, rating scale

Human ADHD rating scales modified for use in dogs have been validated and replicated (2, 4). They have been used for examining genetic contributions to the variability of ADHD-like behaviours in dogs (1). Hypersensitivity-Hyperactivity (HSHA) syndrome is considered to be a behavioural model of human ADHD (3). This prospective study evaluated the relevance of a translated version of Lits' scale in studying dogs with HSHA syndrome.

Seventy-eight owners of 78 dogs presenting with HSHA filled out a questionnaire, and a control group of 78 healthy animals were matched as closely as possible in terms of breed, age and sex. The mean weight, age and sex ratio were 23.2 kg, 20 months and 1.7 in the HSHA group and 23.5 kg, 21 months and 1.2 in the control group, respectively. The distribution of the two populations was plotted using a box-and-whisker plot. The accuracy of the scale in discriminating HSHA cases from normal dogs was evaluated using Receiver Operating Characteristic (ROC) curve analysis.

The total score ranged from 15 to 46 with a mean of 29.24 in the HSHA group, whereas it ranged from 3 to 29 with a mean of 15.69 in the control population. The two groups were statistically different. The Area Under the ROC curve was 0.952 (95% Confidence Interval 0.922-0.982).

This scale showed a very good discrimination between dogs with HSHA and healthy matched controls. The determination of an appropriate threshold score should help screen for HSHA syndrome in dogs and encourage behavioural consultation.

REFERENCES

1. HEJJAS, K., KUNINYI, E., RNAI, Z., SZEKELY, J., MIKLOSI, A., SASVARI-SZEKELY, M., KERESZTURI, E. (2009). Molecular and behavioral analysis of the intron 2 repeat polymorphism in the canine dopamine D4 receptor gene. *Genes Brain and Behav.* 8, 330–336. <https://doi.org/10.1111/j.1601-183X.2008.00475.x>
2. LIT, L., SCHWEITZER, J., IOSIF, AM., OBERBAUER, A. (2010). Owner reports of attention, activity, and impulsivity in dogs: a replication study. *Behav Brain Funct.*, 6:1. <https://doi.org/10.1186/1744-9081-6-1>
3. MARLOIS, N. (2001). Hyperactivity in dogs, a model for human pathology: Discrepancies between different approaches. *Proceeding of the third International Congress on veterinary behavioural medicine.* Vancouver. 212-214.
4. VAS, J., TOPAL, J., PÉCH, E., MIKLOSI, A. (2007). Measuring attention deficit and activity in dogs: A new application and validation of a human ADHD questionnaire. *Appl Anim Behav Sci.* 103, 105-117. <https://doi.org/10.1016/j.applanim.2006.03.017>

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Development of behaviour tests for age-related cognitive decline in family dogs

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Conflicts of interest: None declared

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Keywords: ageing dogs, cognitive decline testing,

There are no established behaviour tests to measure age-related cognitive decline during behaviour consultations, and to distinguish healthy from pathological ageing in family dogs^[1]. We designed 11 cognitive tests measuring activity (exploration^[2], play), training (motivation, persistency), sociality (dependency, communication, help-seeking), attention^[3] (social, sustained, selective, attention capture), memory (working, short-term^[4]), learning^[5] (flexibility, problem-solving), visuo-spatial^[6] and executive function. We tested 126 adult dogs, screened for overt medical and sensory-motor conditions, comparing old (age 10.49 years±1.6, range 7.78-14.54) with young dogs (4.54 years±1.34, range 2.61-6.73).

Young dogs remembered better than old dogs the location of food in a 5-trial memory test (N = 126, poissonGLM_{Age+Trials}: $\beta_{\text{old-young}} = 0.611 \pm 0.19$, $p=0.001$; $\beta_{\text{trials}} = -0.15 \pm 0.06$, $p=0.017$). They learned a discrimination and a reversal learning, with 2 stimuli-types, within less trials (Cox Regression_{Learning}: N = 107, $HR_{\text{young}} = 1.89$, $p=0.003$; $HR_{\text{location-type}} = 0.69$, $p=0.084$; Cox Regression_{Reversal}: N = 89, $HR_{\text{young}} = 2.73$, $p < 0.001$; $HR_{\text{physic-type}} = 0.26$, $p < .001$). Old dogs were less likely to approach a novel object compared to young dogs (Cox Regression: N = 106, $HR_{\text{old}} = 0.56$, $p=0.039$; $HR_{\text{novel}} = 1.473$, $p=0.038$). We found no age difference in the number of objects

explored within a novel environment, manipulation of a food-toy, mistakes in problem-solving, and cognitive bias tests (all $p > 0.05$).

We identified several short, simple tasks to objectively detect age-related differences in working and short-term memory, learning, and visuo-spatial function in healthy-ageing family dogs. Future research should investigate the diagnostic value of such tests for pathological cognitive decline.

REFERENCES

1. SZABÓ, D., GEE, N.R. AND MIKLÓSI, Á., 2016. Natural or pathologic? Discrepancies in the study of behavioral and cognitive signs in aging family dogs. *Journal of Veterinary Behavior: Clinical Applications and Research*, 11, pp.86-98.
2. ROSADO, B., GONZÁLEZ-MARTÍNEZ, A., PESINI, P., GARCÍA-BELENQUER, S., PALACIO, J., VILLEGAS, A., SUÁREZ, M.L., SANTAMARINA, G. AND SARASA, M., 2012. Effect of age and severity of cognitive dysfunction on spontaneous activity in pet dogs—part 1: locomotor and exploratory behaviour. *The Veterinary Journal*, 194(2), pp.189-195.
3. WALLIS, L. J., RANGE, F., MÜLLER, C. A., SERISIER, S., HUBER, L., & VIRÁNYI, Z. 2014. Lifespan development of attentiveness in domestic dogs: drawing parallels with humans. *Frontiers in psychology*, 5, 71.
4. PIOTTI, P., SZABÓ, D., WALLIS, L., BOGNÁR, Z., STIEGMANN, B.S., EGERER, A., MARTY, P. AND KUBINYI, E., 2017. The effect of age on visuo-spatial short-term memory in family dogs. *Pet Behaviour Science*, (4), pp.17-19.
5. WALLIS, L.J., VIRÁNYI, Z., MÜLLER, C.A., SERISIER, S., HUBER, L. AND RANGE, F., 2016. Aging effects on discrimination learning, logical reasoning and memory in pet dogs. *Age*, 38(1), p.6.
6. MONGILLO, P., ARAUJO, J.A., PITTEI, E., CARNIER, P., ADAMELLI, S., REGOLIN, L. AND MARINELLI, L., 2013. Spatial reversal learning is impaired by age in pet dogs. *Age*, 35(6), pp.2273-2282.

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How language used to describe dog behaviour may both inform and prejudice perception and accurate interpretation of canine intent

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Conflicts of interest: the author declared none

Keywords: dog behaviour, descriptive language, bias

When any verbal history is taken regarding the problem behaviour of a dog, words will be used by owners to give their view on what a dog does, why they do it and what they would like from their dog. Unravelling the language used and why they choose those words/phrases, can be enormously helpful in understanding an owner's perception and attitude, as well as give an informed guide as to how to address their concerns during any consultation. Descriptions such as being 'too dominant', 'stubborn', 'having a mind of his own', being 'strong-willed' and 'disobedient', as well as 'deciding he knows better than me', are all too common. Equally, in a legal adversarial system (as in the UK), similar descriptions may be used to condemn a dog when alleging 'dangerousness'.

A recent case of a 2½ year old male working Cocker spaniel showing supposed 'dominance aggression' towards his female owner over resources will be discussed. The owners' wish was that he would 'understand that we are in charge and that asking for compliance with the rules does not mean he is losing face', as well as to 'love himself' and to be 'happy'. How these words were interpreted in directing the course of this consultation, as well as questioning the understanding when such words are used and translated into other languages, including in legal cases, is of ultimate importance.

REFERENCES

1. EVANS, N AND LEVINSON, S (2009) 'The myth of language universals; language diversity and its importance for cognitive science'. *Behavioural and Brain Sciences*, Vol 32, issue 5, 429-448
2. MORALES, A AND HANSON, WE (2005) 'Language brokering: an integrative review of the literature'. *Hispanic Journal of Behavioural Sciences*, Vol 27, Issue 4, 471-503
3. KIDA, P (2013) 'Attitudes towards intra-lingual and inter-lingual translation in courtrooms in Japan: implications for court interpreters' *Ritsumeikan Journal of Asia Pacific Studies*, Vol 32, 62-74
4. MOORE, C, ROMNEY, A, HSIA, T AND RUSCH, C (1999) 'The universality of the semantic structure of emotion terms – study of inter- and intra-cultural variability'. *American Anthropologist*, Vol 1, Issue 3, 529-546

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A novelty test to assess temperament in equine athletes

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Conflicts of interest: The authors declared there were none.

Keywords: horses, temperament assessment

An accurate selection of an individual for a given activity is fundamental, especially in horses, which are requested to perform many different activities. Temperament assessment is an interesting tool for the study of reactivity, activity, emotionality and sociability. This study intended to validate a temperament test through physiological and behavioural assessments. 41 adult horses (23 geldings, 1 stallion, 17 mares) participated in this study. The test comprised 5 phases: habituation, approach to an unknown person, reactivity to an umbrella opening, coping strategies to poles on the floor and a social isolation phase. During all the phases, heart rate variability (HRV) and behaviour were assessed. As control, HRV was also assessed in the usual living area of the horse, at liberty, without any influence. Statistical analysis was carried out using 9.4 SAS software.

Concerning heart rate, significant differences between the phases were observed ($F=20.55$; $p<0.0001$; repeated measures ANOVA using proc MIXED). No significant differences were observed for low frequency/high frequency ratio. On the contrary, very low frequency showed significant differences between phases (Friedman test using proc FREQ; Chi-square=39.82; $p<0.0001$). A phase effect was observed on exploratory behaviour (Friedman test using proc FREQ; Chi-square=28.33; $p<0.0001$). No significant differences were observed for the other studied behaviours.

Physiological and behavioural characteristics found during the different phases of this temperament test allowed us to assess reactivity, emoti-

onality, activity and sociability in a population of horses. Temperament assessment provides interesting information that is useful before adopting an animal or in adapting its living conditions.

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Intraspecies horse aggression

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Conflicts of interest: The author declared she had none.

Keywords: Horse, intra-species aggression

PRESENTING SIGNS AND HISTORY

A 15-year-old, Quarter Horse gelding presented for the performance of “sudden onset, dominant” aggressive (chasing and biting) behaviour to conspecifics at pasture. The problems commenced approximately 6 weeks prior to when the patient was put in a group with a Welsh pony gelding. Carefully history taking revealed that initially the Welsh pony gelding used to chase the patient away and that the patient then became aggressive to that specific gelding progressing to the other geldings and eventually to all conspecifics. The patient would also attack others if he could not readily access his target. Furthermore the patient had not been adequately socialised to other horses when young and had a history of aggressive behaviour to other horses.

PHYSICAL EXAMINATION

The patient had bone spavin and kissing spines for which he had been treated. No other abnormalities were found from routine physical examination or blood testing.

DIAGNOSIS

Intra-species and redirected aggression.

TREATMENT

Treatment with fluoxetine (80 mg per os SID) and operant (positive reinforcement) counter-conditioning whilst walking with another gelding in anti-parallel formation were recommended. Separation from conspecifics was also recommended until such time the patient showed behaviours indicative of a positive emotional response to conspecifics.

FOLLOW UP

After 3 weeks of therapy, the patient was slowly reintroduced to the other horses by adding one more horse or pony to the social group over a two week period. No further problems were observed and the horse was weaned from fluoxetine after a few months.

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Firework fears in dogs – links with health, demographics, behaviour problems, and owner training effort

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Conflicts of interest: the authors declared there were none. This research was funded by the University of Bern.
Keywords: dog *Canis familiaris*, noise fears, questionnaire survey, aetiology, management and treatment

1. INTRODUCTION

Noise sensitivities represent a prevalent welfare problem in dogs. We performed a survey to explore severity and progression (improvement/deterioration) of firework fears in dogs, and relationships with demographics, health, behaviour problems, and owners' management and training to alleviate firework fears.

2. METHODS

A questionnaire survey was distributed online to a sample of German-speaking dog owners. Principal component analyses on data for 247 dogs yielded four factors describing behaviour problems (other than firework fears) and four factors pertaining to owners' management methods relating to fireworks. These factors, as well as the variables: breed group, age, health status, and whether owners had attempted training for noise fears, were included as predictors in general linear models to assess relationships with the severity and progression of firework fears.

3. RESULTS

There was a significant effect of breed group ($p < 0.001$) but not age ($p = 0.34$) on the severity of firework fears. Dogs with health problems were significantly more affected ($p = 0.04$). Severity was significantly positively correlated with general fearfulness ($p = 0.009$) and fear of noises such as thunder and gunshots ($p < 0.001$), but not with fear aggression ($p = 0.23$) or resource aggression ($p = 0.38$). Both improvement and deterioration of firework fears were frequently reported. Training for noise fears ($p = 0.03$) and environmental modification ($p = 0.01$) were associated with significantly lower progression scores, indicating some efficacy of the training efforts. However, noise desensitization CDs were considered effective by less than half of those who had used them.

4. CONCLUSIONS

Ways to optimise training by owners to prevent/ treat noise fears should be investigated.

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Anxiolytic effect of dexmedetomidine oromucosal gel (Sileo®) and gabapentin in feline travel anxiety model

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Conflicts of interest: MK is an employee of Orion Corporation, Orion Pharma, Finland, Study was in part funded by Orion Corporation. Author travel sponsored by Orion Corporation. The other authors declared no conflict of interest.

Keywords: travel, anxiety, feline, dexmedetomidine, gabapentin

The objective was to evaluate the anxiolytic effect of dexmedetomidine oromucosal gel and gabapentin¹ capsule compared to a placebo capsule in cats using a travel anxiety model. Furthermore, the validity of the travel anxiety model for assessing signs of feline fear and anxiety during car ride was studied. The study was blinded, randomised and used a controlled Latin-square design. Twelve cats from a research colony were assessed on baseline, then treated with dexmedetomidine 0.0225 mg, gabapentin 100 mg or placebo on Days 0, 4 and 8. Heart rate, respiratory rate, and serum cortisol were measured before and after a car ride, and cats' behaviours during transport were video recorded. Linear or generalised linear mixed models with Tukey's test were used ($p < 0.05$).

In both active treatments, post-car ride cortisol was significantly lower than at baseline ($p < 0.0005$) while cortisol was significantly ($p < 0.05$) higher in the placebo group than both treatment groups. In addition, all but one cat, after active treatment, had decreased cortisol compared to placebo. Cats in both active treatment groups showed significantly ($p < 0.001$) less lip licking compared to baseline, while the lip licking was significant greater

in the placebo group than both treatment groups ($p < 0.05$). In the dexmedetomidine group cats demonstrated less escape behaviours compared to baseline ($p < 0.05$).

This study indicates that both dexmedetomidine oromucosal gel and gabapentin reduce signs of fear, anxiety and stress in cats and further serves to validate this methodology as a model for feline travel anxiety.

REFERENCE

1. VAN HAAFTEN KA, EICHSTADT FORSEITH LR, STELOW EA ET AL, 2017. Effects of a single pre-appointment dose of gabapentin on signs of stress in cats during transportation and veterinary examination. *J Am Vet Med Assoc* 251: 1175-1181

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Supplementation with a novel lipid extract improves frontal lobe linked cognitive deficits in aged beagle dogs

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Conflicts of interest: JAA, AP and ST are employed by InterVivo Solutions Inc. SS is an employee of Bioiberica S.A.U. NWM and IM are employees of CanCog Technologies Inc. The study was funded by a contract from Bioiberica S.A.U. to InterVivo Solutions Inc. The protocol was approved in accordance with the guidelines of the Ontario Ministry of Agriculture, Food and Rural Affairs and the Canadian Council on Animal Care.

Keywords: Canine cognitive dysfunction, executive function, lipids, memory, supplement.

Canine cognitive dysfunction syndrome (CDS) is an increasingly prevalent behavioural disorder of aged dogs that is attributed to pathological brain aging and can be objectively evaluated using neuropsychological test batteries¹. The current study sought to evaluate the effectiveness of supplementation with a novel lipid extract (Bioiberica S.A.U., Barcelona, Spain) on improving or attenuating cognitive deficits in aged Beagle dogs. Performance across discrimination learning, delayed non-matching to position (DNMP) and selective attention tasks were used to establish two cognitively-balanced groups (N=12) of aged Beagle dogs at baseline². Dogs received either the supplement, or a placebo control, daily (PO) for 6 months. Changes in cognitive function were evaluated using the DNMP, selective attention, discrimination retention, reversal learning and spatial discrimination and reversal learning tasks, and brain metabolism was assessed with magnetic resonance imaging (MRS).

A significant ($p=0.02$) decline in DNMP performance was seen in placebo-treated dogs, but not in dogs receiving the test product, which supports a treatment benefit on attenuating short-term memory loss³. The test product group also demonstrated significantly ($p=0.01$) improved performance on the most difficult spatial discrimination and reversal task pattern and on reversal learning ($p=0.04$) compared to placebo, which reflects improved executive function⁴. Magnetic resonance spectroscopy revealed a significant ($p=0.048$) increase in frontal lobe glutamate and glutamine in the treatment group compared to placebo.

The results of the current study support the use of this supplement in supporting frontal lobe based cognitive function, which is impaired early in canine cognitive decline⁵, and for treatment of CDS.

REFERENCES

1. LANDSBERG, GM; NICHOL, J & ARAUJO, JA 2012, 'Cognitive dysfunction syndrome: A disease of canine and feline brain aging', *Veterinary Clinics of North America: Small Animal Practice*, vol. 42, no. 2, pp. 749-768.
2. PAN, Y, LARSON, B, ARAUJO, JA, LAU, W, DE RIVERA, C, SANTANA, R, GORE, A & MILGRAM NW 2010, 'Dietary supplementation with medium-chain TAG has long-lasting cognition-enhancing effects in aged dogs', *British Journal of Nutrition*, vol. 110, no. 1, pp. 40-49.
3. ZANGHI, BM, ARAUJO, JA & MILGRAM NW 2015, 'Cognitive domains in the dog: Interdependence of working memory from object learning, selective attention, and motor learning', *Animal Cognition*, vol. 18, no. 3, pp. 789-800.
4. TAPP, PD, SIWAK, CT, ESTRADA, J, HOLOWACHUK, D & MILGRAM NW 2001, 'Size and reversal learning in the beagle dog as a measure of executive function and inhibitory control in aging', *Learning and Memory*, vol. 8, no. 6, pp. 317-325.
5. STUDZINSKI, CM, CHRISTIE, LA, ARAUJO, JA, BURNHAM, WM, HEAD, E, COTMAN, CW & MILGRAM NW 2006, 'Visuospatial function in the beagle dog: An early marker of cognitive decline in a human model of aging and dementia', *Neurobiology of Learning and Memory*, vol. 86, no. 2, pp. 197-204.

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Imepitoin: preclinical and clinical evidence of its potential as an anxiolytic

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Conflicts of interest: The work presented here and this presentation was sponsored by Boehringer Ingelheim. This abstract was written by DSM, BI have approved the abstract and made available to DSM all relevant data at his request, without asking for any change to content. The views expressed are those of DSM based on the data provided to him by the co-authors

Imepitoin is a low affinity partial agonist of the benzodiazepine binding site of gamma amino butyric acid A receptors. Preclinical data show that imepitoin reduces corticotrophin releasing factor induced activity in mouse locus coeruleus, and has anxiolytic effects on rodents in a range of laboratory test models of anxiety (elevated plus maze, light dark crossing, social interaction test, Vogel conflict test). The drug is licensed in Europe as an anti-epileptic agent for use in dogs, and its potential value as an anxiolytic agent has recently been reported in this species¹. A prospective placebo-controlled randomized double blind multicentric GCP clinical trial was conducted evaluating the effect of imepitoin on fear responses associated with the noise of fireworks around New Year's Eve ($n=238$ for safety evaluation, 226 full analysis set) using an adapted version of the Lincoln Sound Sensitivity Scale and owner assessment of the overall effect, measured

on a five-point ordinal scale as co-primary endpoints. The treatment group showed significantly lower anxiety score during exposure to fireworks (mixed model analysis, $p < 0.0001$) with a mean treatment difference of -6.1 (95%CI -8.1,-3.6). The owner assessed overall treatment effect (Generalized linear model with logit link function, $p < 0.001$), showed an odds ratio of 4.689 (95%CI (2.79, 7.89), indicating superiority of imepitoin compared to placebo.

These data indicate the wide potential value of imepitoin in veterinary behaviour practice.

REFERENCE

1. MCPEAKE, K.J. AND MILLS, D.S., 2017. The use of imepitoin (Pexion™) on fear and anxiety related problems in dogs—a case series. *BMC veterinary research*, 13(1), p.173.

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Development and validation of a canine travel anxiety model

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Conflicts of interest: The authors declared none. The study protocol was approved by Vivocore's Internal Animal Care and Use Committee.

Keywords: travel, stress, anxiety, dog, cortisol

Stress during transportation is a prevalent issue in both dogs and cats. In a study of over 900 client-owned dogs, approximately ¼ of the dogs responded negatively to travel¹. The objective was to develop and validate a model of canine travel-induced mild anxiety using dexmedetomidine oromucosal gel as a positive control².

All animals involved in this investigation were housed at the Vivocore facility (Fergus, Ontario) for no less than six months. Twelve Beagle dogs were assessed at baseline during a ten-minute car ride. For travel procedures, subjects were placed in a crate within 5 minutes of the test time. The crate met minimum Canadian requirements for a medium sized dog (24" by 30") and consisted of mesh wire sides and a rubber floor mat. The crate was secured in the back of a suitable vehicle (i.e. cargo van). Once the animal and crate were in place, the 10-minute session began. Two staff members were present in the vehicle. One person operated the vehicle while the second person monitored the animal. Four video cameras were mounted within the van to provide a 360° view of the dog for subsequent data analysis as required. The vehicle travelled for approximately 10 minutes. The course taken for each session was identical and the driver attempted to keep the speed of the session consistent between trials, as well as other

factors such as noise and temperature. During the car rides, the heart rate (HR) of each subject was monitored for 3 minutes prior to and during the car ride. The Polar H7 heart rate sensor with chest strap was used to collect a continuous heart rate from the dog, which was transferred via Bluetooth to a tablet within the vehicle. The strap was placed around the dog's chest, just behind the forelimbs and the sensor was orientated at the side of the chest, where a small patch of fur had been shaved. Contact gel was used to improve contact of the sensor. The heart rate chest strap was placed on the dog 7-8 minutes prior to the test time, allowing the dog to be habituated to the strap for a minimum of two minutes. This was followed by three minutes of heart rate recording while the dog was at rest (prior to the test). The dog was then placed into the van within approximately 2 minutes following recording of the resting heart rate. During the trip, heart rate was recorded at 1-minute intervals. Serum cortisol levels were evaluated one hour prior to and following the car ride. Also, dogs were video-taped for behavioural observations such as frequency of vocalization, defaecation, vomiting, urination and salivation. Video files from each session were saved for future behavioural assessments including duration of lying down, sitting, standing and frequency of lip licking, panting and yawning. These parameters were recorded manually by Keypress within an event mark program.

Using a crossover design over three subsequent car rides, all dogs were treated once with placebo and once with dexmedetomidine oro-mucosal gel (125µg/m²) one hour before transportation. Linear mixed models with Tukey's test were used ($p < 0.05$). Mean post-transportation cortisol level in the dexmedetomidine group was significantly lower ($p < 0.05$) than baseline, but not in the placebo group. During the treatment phase, mean post-transportation cortisol was significantly less ($p < 0.05$) with dexmedetomidine compared to placebo. During the car ride, heart rate was significantly less with dexmedetomidine group to baseline ($p < 0.0001$). Also, both mean pre- and during car ride heart rates were significantly ($p < 0.0001$) lower for dexmedetomidine compared to placebo. Lip licking frequency was significantly ($p < 0.001$) less than baseline in the dexmedetomidine group but not the placebo group. Finally, lip licking was significantly ($p < 0.05$) less in the dexmedetomidine group than the placebo group.

These results validate the travel anxiety model using cortisol, heart rate, lip licking and possibly panting as measures, and demonstrates a

significant effect of dexmedetomidine oro-mucosal gel in reducing signs of anxiety.

REFERECES

1. MARITI C, RICCI E, MENGOLI M ET AL. 2012. Survey of travel related problems in dogs. *Veterinary Record*, 170: 542,
2. AMAT M, LE BRECH S, GARCIA-MARATO C ET AL. Preventing travel anxiety using dexmedetomidine hydrochloride oromucosal gel. In Denenberg S (ed). *Proc 11th International Veterinary Behaviour Meeting*, CABI Oxfordshire UK, 2018; 20-21

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I think my dog is relaxed. Isn't he? Owner awareness regarding their dog's signalling

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Conflict of interest: none
Key words: human-dog, benign interaction, owner awareness, social conflict

Humans appear to be able to recognize high levels of stress in dogs, but are less aware of dog's subtle signalling aimed at defusing social conflict. Our study aimed to investigate owner awareness of social defuse signalling (i.e. yawning, blinking, nose licking, ears back, turning head away, turning body away, sitting paw lifting) by comparing owner reporting (home video and OEQ questionnaire) with expert observation (home video, observation during consultation) relating to the type of referral towards a behaviour specialist.

The study sample included 200 dogs with impaired social functioning towards familiar people following benign interactions referred to a behavioural referral practice between 2013 and 2015. From the 200 dogs, respectively 142 were referred by a general practitioner (VET), 48 by a Dog Rehabilitation Trainer (DRT), and 10 by a Dog Trainer (DT).

The number of owners reporting defuse signs was 34/200, while the number of dogs showing defuse signs on home-videos was 136/200 and during consultation 197/200. Interestingly, the odds of reporting subtle stress signalling by owners was found to be 5.1 times larger (however not significant) for owners referred from DT compared to referral from VET (95%CI [0.5; 54.6]), but 77 times larger for owners referred from DRT compared to referral from VET (95%CI [21; 279]).

These results stress the discrepancy between contexts perceived by owners as "relaxed" and reported as such, versus dog's conflict signalling observed on video and during behavioural examination. They also highlight the role of dog professionals in creating awareness about dog's social functioning.

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Objective Pain Assessment in Donkeys – scale construction

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Conflict of interest: None of the authors have any conflict of interest

Sources of funding: The Donkey Studbook of the Netherlands provided additional funding for equipment, travel and lodging in the UK. The Donkey Sanctuary provided working space, technical and veterinary support for the involved students

Ethical review and approval: This study observed patients and control Donkeys owned by The Donkey Sanctuary which required veterinary treatment for a medical condition or post-operative care following surgery. Neither the authors nor the observers were involved in the diagnose and / or treatment of the patient Donkeys.

Objective recognition of pain in horses has been studied extensively, however studies on objective pain assessment in donkeys are limited, and the available scales are not validated. This study describes scale construction and clinical applicability of a Composite Pain Scale (do-CPS) and a Facial Assessment of Pain scale (do-FAP) for acute pain in donkeys. A cohort follow-up study using 159 adult donkeys (n=44 patients, n=115 control donkeys) at The Donkey Sanctuary. Patients presented with lameness (24), colic (7), head related pain (7) or post-operative pain (6). Based on equine scales specific potential elements and scores for donkeys were developed in a pilot study. For each animal, the score of each element in both scales was assessed by two independent observers. When applicable patients were followed over time for three days. Patients vs controls were tested by MannWhitney-U-tests. The inter-observer reliability was strong for do-CPS ($R^2=0.95$, $p<0.001$) and good for do-FAP ($R^2=0.77$, $p<0.001$). Patients showed significantly higher pain scores, compared to control donkeys ($p<0.001$ for both do-FAP and do-CPS). Sensitivity overall for the do-CPS (73%), do-FAP (68%), and specificity do-CPS (99%), do-FAP (75%) were good. Sensitivity and specificity for “lameness” were strong in do-CPS (92% and 100%, respectively). Sensitivity and specificity for “colic” were strong for both do-CPS (71% and 100%, respectively), do-FAP (95% and 79%, respectively). A follow-up study with complete new dataset will be performed to validate the constructed scales. Objective pain assessment in donkeys is possible and could support objective evaluation of treatment of donkeys with acute pain.

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“Sensory Processing Sensitivity”: a dog’s personality moderates the influence of owner personality and communication style on the occurrence of behaviour problems

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This study was funded by the Margaret and Francis Fleitmann Foundation. The authors declare no conflict of interest.

In humans, the personality trait “sensory processing sensitivity” (SPS) has been shown to moderate how a positive and negative childhood environment influences the emotional and cognitive development of a child (1,2). A trait comparable to SPS has recently been demonstrated in dogs (3). The aim of this study was to investigate the influence of SPS in dogs on the occurrence of behaviour problems.

An online questionnaire was distributed in English and German. The questionnaire contained the validated Highly Sensitive Person Questionnaire, resulting in an SPS score for the owner, the Highly Sensitive Dog Questionnaire, resulting in an SPS score for the dog, and information on the dog’s history, living surroundings, training styles, and health and behaviour problems.

Owners (91% female, 9% male) of 3647 dogs returned completed questionnaires. Dog breeds were grouped according to the FCI, dog sex was evenly distributed (50% males and females, of which 68% and 76% were neutered, respectively).

Linear mixed effect models indicated that behaviour problems occurred more frequently in dogs scoring higher on the SPS scale ($z = 3.87$, $p < 0.001$), in dogs receiving positive punishment ($z = 1.74$, $p < 0.1$), in dogs receiving negative punishment and scoring higher on the SPS scale ($z =$

2.04 , $p < 0.05$), and when the discrepancy of the SPS scores between dog and owner was greater ($z = 2.72$, $p < 0.01$).

These results indicate that, similar to humans, a dog’s personality moderates how environmental, particularly owner, influences affect the occurrence of behaviour problems.

REFERENCES

1. ARON EN, ARON A. Sensory-processing sensitivity and its relation to introversion and emotionality. *J Pers Soc Psychol.* 1997; 73:345-68.
2. ARON EN, ARON A, DAVIES KM (2003) Adult shyness: the interaction of temperamental sensitivity and an adverse childhood environment. *Personality and Social Psychology Bulletin*, 31, :181-97.
3. BRAEM M, ASHER L, FURRER S, LECHNER I, WÜRBEL H, MELOTTI L (2017) Development of the “highly sensitive dog” questionnaire to evaluate the personality dimension of “sensory processing sensitivity” in dogs, *PLOS One*, doi.org/10.1371/journal.pone.0177616

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Problem solving strategies in family dogs (Canis familiaris) diagnosed with separation anxiety-related disorders after a short separation from the owner, in controlled laboratory setting

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The authors declare that there are no financial and/or non-financial conflicts of interest."

Separation related disorder (SRD) in dogs is defined as an anxiety-related disorder that comes from a maladaptive stress response (1,2). Furthermore, high anxiety level is related with an impaired cognitive performance (3) and problem-solving strategies (4)

The aim of this study is to find differences between dogs with and without SRD in their cognitive performance, coping strategies and communicative signals towards humans, when they are confronted with a solvable/unsolvable task after being exposed to a short separation from their owners (5).

In controlled laboratory settings we tested two groups of adult family dogs with and without SRD (n=20/group, different breeds, both sexes). The subject was exposed to a solvable/unsolvable task paradigm, during which – in between the solvable and unsolvable trials - we also run a short

separation test from the owner. Dogs' behavior was recorded by means of video cameras.

Preliminary results show that dogs without SRD try to solve the unsolvable trial in shorter latency and look back to the experimenter (seeking for assistance) more than dogs with SRD, while dogs with SRD spend more time away from the apparatus and in proximity to the owner.

This study helps to better understand the mental state of dogs with SRD shortly after the reunion with the owner, and our findings suggest that SRD might influence dogs' problem-solving strategies and socio-communicative interactions with humans.

REFERENCES

1. HORWITZ, D. (2001). Separation anxiety in dogs. In Atlantic Coast Veterinary Conference. VIII. Literaturverzeichnis (Vol. 99).
2. SHERMAN B.L 2008 Separation anxiety. Compendium. Contin. Educ. Pract.Vet 30, 27-42
3. SHACKMAN, A. J., SARINOPOULOS, I., MAXWELL, J. S., PIZZAGALLI, D. A., LAVRIC, A., & DAVIDSON, R. J. (2006). Anxiety selectively disrupts visuospatial working memory. *Emotion*, 6(1), 40
4. PASSALACQUA, C., MARSHALL-PESCINI, S., MEROLA, I., PAL-ESTRINI, C., & PREVIDE, E. P. (2013). Different problem-solving strategies in dogs diagnosed with anxiety-related disorders and control dogs in an unsolvable task paradigm. *Applied animal behaviour science*, 147(1), 139-148
5. PASSALACQUA, C., MARSHALL-PESCINI, S., BARNARD, S., LAKATOS, G., VALSECCHI, P., & PREVIDE, E. P. (2011). Human-directed gazing behaviour in puppies and adult dogs, *Canis lupus familiaris*. *Animal Behaviour*, 82(5), 1043-1050.

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Effects of “reading to dogs” on reading practice and cognitive abilities in children with pervasive developmental disorder

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INTRODUCTION

Systematic reviews are available on the effects of human-animal interaction in educational settings specifically focusing on reading to dogs (1). However, we have less data on the effects on cognition and learning skills in children with pervasive developmental disorder (PDD). The aim of this study was to evaluate whether a social environment enriched heterospecifically by the presence of a dog while reading a book would affect several abilities of PDD children

METHODOLOGY

Nine PDD children (6-8 years old) were involved in 10 weekly reading sessions. Children were randomly assigned to the control (CG, dog absent-n. 4 children) or the experimental group (EG, dog present-n. 5 children). Children-dog physical interactions were not allowed. Psychologists administered reading and cognition tests to all children at baseline and at the end of the reading sessions.

MAIN RESULTS

Statistical analyses are ongoing and the complete results will be presented during the congress. However, we can affirm that EG children compared to CG were more motivated to follow reading sessions and more easily created a social group. They also asked parents to read a book more frequently.

CONCLUSIONS

In line with the literature, and according to our preliminary results, dogs should be considered when planning therapeutic interventions for PDD children. Further studies are necessary in order to understand whether and how the child-dog interaction is beneficial to PDD children's at social-emotional and cognitive level and to link the well-being of humans and other animals, from a “One Health” and “One Welfare” point of view. (2-3).

REFERENCE

1. HALL, SS., GEE, NR., MILLS DS. CHILDREN READING TO DOGS: A Systematic Review of the Literature. *Plos One*. 11(2), 2016.
2. MILLS, DS. One health – one welfare: Psychological and physical well-being. In: *WSAVA/FECAVA/BSAVA World Congress. Proceedings Online*. Birmingham: April 11-15, 2012.
3. PIRRONE, F. Animal assisted intervention (AAI) for children in either research, practice or policy from a One Health perspective. *Ann Ist Super Sanità* 2017, Vol. 53, No. 4

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Puppy Classes may positively affect the behaviour of adult dogs separated from their litters too early

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Conflicts of interest: The authors declared that there were none.

Keywords: dogs, training, puppy classes, behavior, early weaning

Puppies prematurely separated from their littermates seem to be more likely to develop undesirable behaviours related to fear or anxiety than puppies that remained with their mothers and siblings until 60 days of age (1).

Overall, attendance at puppies' socialization programs has shown to help reducing the risk of developing potential problem behaviours later in life (2,3).

In order to assess whether attendance at puppy classes may counteract the adverse effects of early puppy-litter separation on adult dogs' behaviour, we compared the prevalence of owner-reported behaviours in dogs who were separated early (30-45 days) from their litter with (n=83) versus without (n=72) puppy socialisation class attendance.

Owners were asked to complete a questionnaire, providing information about their dogs and whether the animals exhibited any of 14 potential problem behaviours. Pearson's X^2 test of independence in 2x2 contingency tables and binary logistic regressions were applied to analyse the effects of puppy class attendance on behavioural patterns. Given a similar premature separation from the litter, the dogs who had not attended a puppy class had increased odds ($p < 0.05$) of displaying object possessiveness, excessive barking, fearfulness on walks and intraspecific aggression, as reported by the owners, than those who had been to puppy classes. The

knowledge that early socialisation and training program may mitigate an already elevated risk of developing potential problem behaviours in adult dogs who were prematurely separated from their litters will prevent later behaviour problems, and prompt intervention programs.

REFERENCES

1. PIERANTONI, L., ALBERTINI, M., PIRRONE, F., 2011. Prevalence of owner-reported behaviours in dogs separated from the litter at two different ages. *Vet. Rec.* 169, 468.
2. KUTSUMI A, NAGASAWA M, OHTA M, ET AL. Importance of puppy training for future behavior of the dog. *J Vet Med Sci* 2013; 75(2):141-149.
3. PIERANTONI, L., ALBERTINI, M., PIRRONE, F., 2015. Proceeding PAWSELVA-ECAWBM-ESVCE CONGRESS, Bristol.

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Developing a psychometric tool to measure frustration in dogs

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Conflicts of interest: The authors declared no conflict of interest.

Keywords: dog, frustration assessment

INTRODUCTION

Frustration is considered a negative emotional state (1) and whilst it probably plays a key role in certain behaviour problems in dogs, the literature on this subject is limited. Psychometric tools have been developed and validated for the assessment of behavioural traits in dogs and other species. The aim of the current study was to develop a tool to measure frustration tendencies in dogs.

MATERIAL AND METHODS

An online owner survey was developed using Survey Monkey™. Items covered demographics, training/behavioural history of the dog and 33 items related to frustration scored using a 5-point Likert scale. The questionnaire was disseminated via on-line channels over a 5-month period. 2348 respondents completed the questionnaire, and 273 of these completed it a second time 6 weeks later. Intra-rater reliability was assessed prior to structuring the items using principal component analysis (PCA). Items were retained if they loaded > 0.4. Factors were retained based on eigenvalues >1.

RESULTS

Intra-rater reliability assessment removed 1 item. Thirty-two items were subjected to PCA with oblique rotation (direct oblimin) and 21 items loaded on a meaningful 5-factor solution. There was a significant positive correlation between each factor and the owners' general perception of their dogs' frustration tendencies.

CONCLUSION

This is the first report of a psychometric instrument to measure frustration in dogs. On-going reliability testing and validation with behavioural tests are underway and once complete may allow this tool to be used in the assessment of frustration in canine behaviour problems.

REFERENCE

1. JAKOVCEVIC, A., ELGIER, A.M., MUSTACA, A.E. AND BENTOSELA, M., 2013. Frustration behaviors in domestic dogs. *Journal of applied animal welfare science*, 16(1), pp.19-34.

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Behavioural and endocrine responses of companion dogs (*Canis familiaris*) to short separation-reunion with the owner in a novel environment

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Conflicts of interest: The authors declared there were none. This research was supported by the Grant Line 2 - Action A - 2017 awarded by University of Milan.

As in the case of human mother-child dyads (1), multilevel regulatory processes functioning within owner-dog interaction may become deregulated as a result of separation. While attachment-related behavioural reactions to separation and reunion with the owner are expected from dogs (2), less is known about concomitant physiological reactions. We assessed the behaviour of 26 adult dogs of both sexes and various breeds before, during a short separation episode from the owner and after the reunion in a novel outdoor environment. Salivary levels of oxytocin, vasopressin and cortisol were also measured.

The dogs displayed significantly high exploration of the environment in the presence of the owner. Whining, restlessness, staying close to the fence and staring fixedly beyond it were the most frequent behaviours ($p < 0.05$) during the separation episode. There were no differences between the three phases regarding hormone levels. However, significantly higher vasopressin levels were observed during the separation phase in dogs with a clinical diagnosis of separation-related distress (SRD, $N=12$) compared to dogs without SRD ($N=14$).

The absence of significant hormonal changes suggests that the brief separation-reunion procedure was not stressful enough to activate neuro-endocrine reactivity, unless dogs were affected by SRD. These results

confirm the relevance of the coupled evaluation of physiological and behavioural responses for accurate estimation of animal well-being and emphasize the need for further investigations into the role of vasopressin in the context of the stress axis and anxiety disorders in dogs, also in the light of the therapeutic potential of its modulation.

REFERENCES

1. REHN, T., HANDLIN, L., UVNÄS-MOBERG, K. & KEELING, L.J. (2014). Dogs' endocrine and behavioural responses at reunion are affected by how the human initiates contact. *Physiology and Behavior*. 124 (2014), 45-53.
2. MARITI, C., RICCI, E., ZILOCCHI, M. & GAZZANO, A. (2013). Owners as a secure base for their dogs. *Behaviour*. 150(11), 1275 – 1294.

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Diagnostic performance of individually trained diabetes mellitus alert dogs: a blinded prospective observational study

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Conflict of interest: The authors declare no conflict of interest.

Keywords: Diabetes mellitus alert dogs, diagnostic performance, hypoglycaemia, individual dog training.

INTRODUCTION

Individually trained diabetes alert dogs have been reported to detect hypoglycaemia early, avoid hypoglycaemic coma and increase quality of life in patients with Type 1 diabetes. However, the individual performance of diabetes alert dogs has not been assessed scientifically, yet.¹⁻⁸

METHODOLOGY

In order to evaluate the performance of individually trained diabetes alert dogs, we performed a blinded prospective observational study focussing on the following questions. 1. How sensitive and specific can diabetes alert dogs detect hypoglycaemia? 2. Do diabetes alert dogs detect individual blood glucose cut-off values? Six diabetes alert dogs and their diabetic owners were included in this study. The dogs were requested 50-100 times to indicate hypoglycaemia and blood glucose levels were been measured afterwards. We performed descriptive statistics of the blood glucose profile of each diabetic owner, Fisher's Exact Tests to analyse the detection rate of different levels of hypoglycaemia (<100, ≤70, ≤55 mg/dl) and a receiver

operating characteristics (ROC) curve analysis to detect the area under the curve (AUC), sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and optimum blood glucose cut-off value of each individual diabetes alert dog.

MAIN RESULTS

The performance of the six diabetes alert dogs was different with ROC AUC 0.794-1.000, sensitivity 61.8-100%, specificity 83.1-100%, PPV 58.1-100%, NPV 43.1-100%, and optimum blood glucose cut-off 49-99 mg/dl. Details are presented in the table.

Conclusions

Every diabetic patient had his/her specific blood glucose profile. Every diabetes alert dog indicated its specific blood glucose cut-off value. The diabetes alert dog should be adapted to the blood glucose profile of its owner by an individual training to avoid false alerts as well as stress to the diabetes alert dog by permanent exposure to low blood glucose levels in owners used to it. A more liberal blood glucose adjustment might also be considered. This should be done in close communication with the attending diabetologist. A diabetes alert dog performance check, as used in this observational study, may be useful to evaluate and optimise the individual diabetes alert dog training.

	Team 1 "Happy"	Team 2 "Coco"	Team 3 "Higgins"	Team 4 "Mila"	Team 5 "Sniffy"	Team 6 "Zambo"
Diabetic owner blood glucose profile						
Blood glucose meter	Free-Style Libre	Free-Style Libre	Contour Next One	Free-Style Libre	Contour Next Link	Capillary measurement
Mean \pm SD (mg/dl)	205 \pm 153	118 \pm 60	73 \pm 18	72 \pm 23	118 \pm 88	64 \pm 17
Median (mg/dl)	160	114	71	69	73	63
IQR (mg/dl)	87.5-296	68.5-152	63-79	56.8-78.5	60.5-160	55-70.5
Range (mg/dl)	42-600	31-312	39-141	34-169	34-361	26-101
Dog detection of hypoglycaemia (\leq 70 mg/dl)						
True positive (%)	10	6	51	60	27	75
True negative (%)	73	73	6	22	4	13
True alerts (%)	83	79	57	82	31	87
False positive (%)	12	0	43	18	49	13
False negative (%)	5	21	0	0	20	0
False alerts (%)	17	21	43	18	69	13
P value (Fisher's Exact Test, two-tailed probability)	0.000064	0.000248	0.011731	<0.000001	0.0000046	0.000017
ROC curve Analysis						
Number of Requests	99	100	100	100	100	55
Positive dog alerts (%)	22	6	94	78	76	87
ROC AUC (SE)	0.868 (0.037)	0.986 (0.011)	1.000 (0.000)	0.984 (0.012)	0.794 (0.049)	1.000 (0.000)
Sensitivity (%) [95% CI]	81.8 [59.7-94.8]	100 [54.1-100]	100 [96.2-100]	96.2 [89.2-99.2]	61.8 [50.0-72.6]	100 [92.6-100]
Specificity (%) [95% CI]	83.1 [72.9-90.7]	97.9 [92.5-99.7]	100 [54.1-100]	100 [84.6-100]	91.7 [73.0-99.0]	100 [59.0-100]
PPV (%) [95% CI]	58.1 [39.1-75.5]	75.0 [34.9-96.8]	100 [96.2-100]	97.4 [90.9-99.7]	95.9 [86.0-99.5]	100 [92.6-100]
NPV (%) [95% CI]	94.1 [85.6-98.4]	100 [96.1-100]	100 [54.1-100]	88 [68.8-97.5]	43.1 [29.3-57.8]	100 [59.0-100]
Optimum cut-off (mg/dl)	\leq 99	\leq 49	\leq 98	\leq 78	\leq 73	\leq 75

Table: Diabetic owner blood glucose profile, dog detection of hypoglycaemia (\leq 70 mg/dl; results for $<$ 100 mg/dl and \leq 55 mg/dl are not shown in the table), and ROC curve analysis for team 1-6.

SD = standard deviation; IQR = interquartile range (25% to 75% percentile); ROC = receiver operating characteristics; AUC = area under the ROC curve; SE = standard error; PPV = positive predictive value; NPV = negative predictive value; optimum cut-off for each diabetic alert dog as calculated by ROC analysis.

REFERENCES

- CHEN, M, DALY, M, WILLIAMS, N, WILLIAMS, S, WILLIAMS, C, WILLIAMS, G. (2000). Non-invasive detection of hypoglycaemia using a novel, fully biocompatible and patient friendly alarm system. *BMJ*, 321(7276), pp. 1565-6.
- DEHLINGER, K, TARNOWSKI, K, HOUSE, JL, LOS, E, HANAVAN, K, BUSTAMANTE, B, AHMANN, AJ, WARD, WK. (2013). Can trained dogs detect a hypoglycemic scent in patients with type 1 diabetes? *Diabetes Care*, 36(7), pp. e98-9.
- GONDER-FREDERICK, LA, GRABMAN, JH, SHEPARD, JA, TRIPATHI, AV, DUCAR, DM, MCELGUNN, ZR. (2017). Variability of diabetes alert dog accuracy in a real-world setting. *J Diabetes Sci Technol*, 11(4), pp. 714-719.
- HARDIN, DS, ANDERSON, W, CATTET, J. (2015). Dogs can be successfully trained to alert to hypoglycemia samples from patients with type 1 diabetes. *Diabetes Ther*, 6(4), pp. 509-517.
- LIPPI, G, CERVELLIN, G, DONDI, M, TARGHER, G. (2016). Hypoglycemia alert dogs: a novel, cost-effective approach for diabetes monitoring? *Altern Ther Health Med*, 22(6), pp. 14-18.
- LOS, EA, RAMSEY, KL, GUTTMANN-BAUMAN, I, AHMANN, AJ. (2017). Reliability of trained dogs to alert to hypoglycemia in patients with type 1 diabetes. *J Diabetes Sci Technol*, 11(3), pp. 506-512.
- ROONEY, NJ, MORANT, S, GUEST, C. (2013). Investigation into the value of trained glycaemia alert dogs to clients with type 1 diabetes. *PLoS One*, 8(8), p. e69921.
- WEBER, KS, RODEN, M, MÜSSIG, K. (2016). Do dogs sense hypoglycaemia? *Diabet Med*, 33(7), pp. 934-8.

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Associations between personality traits and disease prevalence in the family dog (*Canis familiaris*); a psychosomatic approach

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Conflicts of interests: The authors declared there were none.

Keywords: dog, psychosomatic disease, behaviour, personality traits,

A considerable proportion of the canine population is suffering from chronic diseases of yet partly unknown pathogenesis that are analogous to the ones considered to be at least partly psychosomatic in origin in humans (1). Human psychosomatic medicine is an interdisciplinary field, which has proven – justified also by laboratory animal studies (2) – that psychological (e.g. personality traits) and social factors may contribute to the development of certain somatic symptoms (3). Based on these facts we hypothesized that specific diseases of family dogs might also be psychosomatic in origin, and associations exist between certain dog personality traits and the presence of medical conditions. We carried out an exploratory owner-report study (N=1664 answers; mixed, cross-breed and purebred family dogs from 157 breeds; all sexes; M^{age}=5.72 ± 3.59 years) using validated dog personality questionnaires (4,5) and assessing the presence of diagnosed, human-analogue chronic idiopathic diseases (i.e. atopic dermatitis, peptic ulcers, malign tumors, etc.).

Our logistic regression model proved to be statistically significant ($\chi^2(18)=59.783$. $p<0.0005$); dogs with high scores on 'Emotional reac-

tivity' and low scores on 'Energy' personality traits were more likely to suffer from an idiopathic disease than to be healthy. We believe that our pioneer research could make the case for the *raison d'être* of an integrative bio-psycho-social approach (6) in studying further canine emotional and physical disorders. This knowledge could also be adapted in practice to improve companion animal welfare status by bringing awareness of owners and professionals to this issue, and fostering the cooperation of ethologists, animal behaviour experts and clinical veterinarians.

REFERENCES

1. KIECOLT-GLASER, JK & MCGUIRE, L & ROBLES, TF & GLASER, R 2002, 'Psychoneuroimmunology and psychosomatic medicine: back to the future', *Psychosomatic medicine*, vol. 64, no.1, pp. 15-28.
2. CORBALAN, R & VERRIER, R & LOWN, B 1974, 'Psychological stress and ventricular arrhythmias during myocardial infarction in the conscious dog', *The American journal of cardiology*, vol. 34, no. 6, pp. 692-696.
3. FAVA, GA & SONINO, N 1999, 'Psychosomatic medicine: emerging trends and perspectives', *Psychotherapy and psychosomatics*, vol. 69, no. 4, pp. 184-197.
4. GOSLING, SD & KWAN, VS & JOHN, OP 2003, 'A dog's got personality: a cross-species comparative approach to personality judgments in dogs and humans', *Journal of personality and social psychology*, vol. 85, no. 6, pp. 1161.
5. HSU, Y & SERPELL, JA 2003, 'Development and validation of a questionnaire for measuring behavior and temperament traits in pet dogs', *Journal of the American Veterinary Medical Association*, vol. 223, no. 9, pp. 1293-1300.
6. ENGEL, GL 1981, 'The clinical application of the biopsychosocial model', *Journal of Medicine and Philosophy*, vol. 6, no. 2, pp. 101-124.

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Dog desocialisation during adolescence

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Conflicts of interest: None were declared

Keywords: dog, de-socialisation, adolescence, age

The socialisation period that dogs undergo between 5 and 12 weeks of age is recognised as being fundamentally important. The behavioural modifications that occur during the juvenile period have not been studied extensively (7), and are very important clinically. Adolescence involves a period of profound physical and mental changes (1) that occurs between the puppy period and adulthood. These changes have an impact on the emotional maturity, motivation, and communication, and thus on the behaviour, of the dog. Around puberty, some dogs seem to lose their interest in social interactions and their ability to communicate. This has been described as de-socialisation (3). The result is an increase in withdrawal or avoidance behaviours. Very often aggressive behaviours appear. Many vulnerability factors must be considered: poor social skills (5, 6), an inability to adjust to human behaviour –Shepherds might be at higher risk (8), genetic factors - VonHoldt (9) has identified a gene for hypersociability, interruption of the socialisation process for various reasons like health problems or weather contingencies, adverse early life experiences (2,7), and physical and mental health. Some conditions may reinforce or reduce aggression, such as communication by the owners and victims and the owners' stability (4). Desocialisation increases the risk of biting and has an impact on the dog's welfare. Treatment may vary depending on the symptoms and the context. Psychotropic drugs can be prescribed if necessary, and should always be used in combination with a behavioural modification plan. This condition can be a real challenge for veterinarians.

REFERENCES

1. CRONE, E.A. (2009). Executive functions in adolescence: interferences from brain and behavior. *Dev Sci.* 12(6), 825-30. doi: 10.1111/j.1467-7687.2009.00918.x.
2. FOYER, P., BJÄLLERHAG, N., WILSSON, W. AND JENSEN, P. (2014). Behaviour and experiences of dogs during the first year of life predict the outcome in a later temperament test. *Appl Anim Behav Sci* 155, 93–100. DOI:10.1016/j.applanim. 2014.03.006.
3. MEGE, C., BEAUMONT-GRAFF, E., BÉATA, C., DIAZ, C., HABRAN, T., MARLOIS, N. AND MULLER, G. (2003). *Pathologie comportementale du chien.* Ed Masson, Paris
4. PODBERSCEK, A.L. AND SERPELL, J. A. (1997). Aggressive behaviour in English cocker spaniels and the personality of their owners. *VetRecord* 141(3), 73-6. DOI: 10.1136/vr.141.3.73
5. RIEMER, S., MÜLLER, C., VIRÁNYI, Z., HUBER, L. AND RANGE, F. (2013). Choice of conflict resolution strategy is linked to sociability in dog puppies. *Appl Anim Behav Sci.* 149(1-4), 36–44. <http://doi.org/10.1016/j.applanim.2013.09.006>
6. RIEMER, S., MÜLLER, C., VIRÁNYI, Z., HUBER, L. AND RANGE, F. (2016). Individual and group level trajectories of behavioural development in Border collies. *Appl Anim Behav Sci.* 180, 78–86. <http://doi.org/10.1016/j.applanim.2016.04.021>
7. SERPELL, J. A. AND DUFFY, D. L. (2016). Aspects of Juvenile and Adolescent Environment Predict Aggression and Fear in 12-Month-Old Guide Dogs. *Front Vet Sci.* 3, 49. <http://doi.org/10.3389/fvets.2016.00049>
8. VAS, J., TOPAL, J., GACSI, M., MIKLOSI, A. AND CSANYI, V. (2005). A friend or an enemy? Dogs' reaction to an unfamiliar person showing behavioural cues of threat and friendliness at different times. *Appl Anim Behav Sci.* 94, 99–115.
9. VONHOLDT, B. M., SHULDINER, E., KOCH, I.J., KARTZINEL, R. Y., ET AL. (2017). Structural variants in genes associated with human Williams-Beuren Syndrome underlie stereotypical hyper-sociability in domestic dogs. *Sci Adv.* 3 (7) DOI: 10.1126/sciadv.1700398.

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The Science of Fear Free: Reviewing the evidence

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Conflicts of interest: Gary Landsberg is under contract as head of Fear Free Research and a Practice Certification Veterinarian.

Keywords: veterinary visits, Fear FreeSM, fear, anxiety, stress

Fear, anxiety and stress (FAS) associated with veterinary visits, lead to emotional distress for patients, owners and veterinary staff, and can have detrimental effects on both physical health and safety (1-3). FAS contributes significantly to a decline in veterinary care (4). Evidence based studies have documented the extent to which FAS affects the pet's health, well-being and level of veterinary care, and how a Fear Free approach can prevent and alleviate FAS (5). These studies demonstrate the effects of FAS on emotional health, physical health, physiological measures such as heart rate, blood pressure, and temperature and on hematologic, biochemistry and endocrine measurements (6-8). Studies have proven the beneficial effects of puppy and kitten counselling and puppy classes in the veterinary clinic on reducing behaviour problems and enhancing veterinary care (9-12). There is evidence to show that drugs, supplements, management products and a Fear Free approach using gentle control and a considerate approach to both handling and the hospital environment can effectively reduce FAS for the pet and owner and increase safety and well-being of veterinary personnel (5,8,13-15).

Fear FreeSM offers practitioners and their staff, Registry Approved Continuing Education (RACE) focused on identifying signs of fear; taking a pro-active approach to promoting a positive experience and eliminating the negatives associated with travel, the veterinary facility, handling and procedures; and the role of pre-visit medications and in hospital sedation.

Together with podcasts, resources, and an online community, Fear Free will provide the tools, training, and support for each member of the veterinary team and the entire veterinary facility to be a positive experience for pets and owners.

REFERENCES

- MARITI C, PIERANTONI L, SIGHIERI C, ET AL, 2017. Guardians' perceptions of dogs' welfare and behaviors related to visiting the veterinary clinic. *J Appl Anim Welf Sci* 20: 24-33
- MARITI C, BOWEN J, CAMPA S, ET AL, 2016. Guardians' perception of cats' welfare and behavior regarding veterinary visits. *J Appl Anim Welf Sci* 19: 375-384
- HEKMAN J, KARAS AZ, SHARP CR. 2014 Psychogenic stress in hospitalized dogs; cross species comparisons, implications for health care, and the challenges of evaluation. *Animals* 4: 331-347
- VOLK JO, FELSTED KE, THOMAS JG, ET AL, 2011. Executive summary of the Bayer veterinary care usage study. *J Am Vet Med Assoc* 238: 1275-1282
- NIBBLETT BM, KETZIS JK, GRIGG EK. 2015 Comparison of stress exhibited by cats examined in a clinic versus a home setting. *Appl Anim Behav Sci* 173: 68-75
- QUIMBY JM, SMITH ML, LUNN KF. 2011. Evaluation of the effects of hospital visit stress on physiologic parameters in the cat. *J Fel Med Surg*, 13: 733-737
- BRAGG RF, BENNETT JS, CUMMINGS A ET AL, 2015. Evaluations of the effects of hospital stress on physiologic variables in dogs. *J Am Vet Med Assoc* 246: 212-15
- SIRACUSA C, MANTECA X, CUENCA R, ET AL, 2010. Effect of a synthetic appeasing pheromone on behavioral, neuroendocrine, immune, and acute-phase perioperative stress responses in dogs. *J Am Vet Med Assoc* 237: 673-681
- CASEY R, LOFTUS BE, BOLSTER C ET AL, 2014. Human directed aggression in domestic dogs (*Canis familiaris*): occurrence in different contexts and risk factors. *Appl Anim Behav* 152: 52-63

10. GAZZANO A, MARITI C, ALVARES S ET AL, 2008. The prevention of undesirable behaviors in dogs: effectiveness of veterinary behaviorists' advice given to puppy owners. *J Vet Behav* 3, 125-33
11. GAZZANO A, BIANCHI L, CAMPA S ET AL. 2015. The prevention of undesirable behavior in cats: effectiveness of a veterinary behaviorists' advice given to kitten owners. *J Vet Behav* 10, 535-542
12. DEPORTER T, SCHULKEY R. 2017. Evaluation of the association between attendance at veterinary hospital based puppy socialization classes and long term retention in the home. *Proc VBS, Indianapolis*, 14-15
13. PEREIRA JS, FRAGOSO S, BECK A, ET AL, 2016. Improving the feline veterinary consultation: the usefulness of Feliway spray in reducing cats' stress. *J Fel Med Surg* 18: 959-964
14. STEVENS BJ, FRANTZ EM, ORLANDO JM ET AL, 2016. Efficacy of a single dose of trazodone hydrochloride given to cats prior to veterinary visits to reduce signs of transport- and examination-related anxiety. *J Am Vet Med Assoc* 249: 202-207
15. VAN HAAFTEN KA, EICHSTADT FORSEITH LR, STELOW EA ET AL, 2017. Effects of a single pre-appointment dose of gabapentin on signs of stress in cats during transportation and veterinary examination. *J Am Vet Med Assoc* 251: 1175-1181

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Fear Free Handling; Combatting Interspecific dog aggression in the veterinary clinic

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Conflicts of interest: The authors declared there were none.

Keywords: dog, handling, fear free, aggression

A 21 month-old intact-male Rhodesian Ridgeback presented with a history of serious aggression to visitors (including the referring veterinarian whom he had bitten) and dogs. The patient was diagnosed with an anxiety disorder and fear-aggression. Several recommendations were made including chemical castration.

Consultation 1: The dog entered the consultation room via a side-door to avoid people and dogs. He wore a Baskerville Muzzle and was on a loose leash. The dog relaxed and settled well on a mat. Attention and relaxation exercises were commenced1.

Consultation 2: Clonidine hydrochloride (0.45mg) was administered orally. Additionally xylocaine ointment (50mg/g) was administered to the implantation site 15 minutes prior to delivery. The dog was chemically castrated with Suprelorin 4.7mg implant. Techniques were used to minimise fear and anxiety; specifically systematic desensitisation and classical counterconditioning (SDCCC) using high value food rewards.

Consultation 3: A breathing exercise was commenced (1). As the dog became more aggressive to other dogs (when the effects of the implant were expected to wane) surgical castration was advised.

Consultation 4: The dog was physically examined and 1.2ml medetomidine 1mg/ml delivered by intramuscular injection using SDCCC with verbal rewards and massage. The dog was referred to the surgical team for castration.

This case highlights that even dogs known to exhibit serious aggressive behaviour can be readily handled using stress reduction techniques. Veterinarians are duty bound to minimise psychological stress in their patients. Several commercial educational programmes are currently available to minimise stress in the veterinary clinic setting. Fear Free is one such example (2).

REFERENCES

1. OVERALL, K., 2013. Manual of Clinical Behavioral Medicine for Dogs and Cats. Elsevier Health Sciences.
2. Fear Free – Taking the ‘Pet’ out of petrified. [online]. Available at: <https://fearfreepets.com>. [Accessed 27 Feb. 2018].

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A descriptive study of Bengal cat behaviour in Belgium and The Netherlands

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Conflicts of interest: The authors declared there were none
Keywords: Cat, Bengal, behaviour

Bengal cats are hybrids resulting from wild leopard cats (*Prionailurus bengalensis*) and domestic American shorthairs. Concerns exist about their suitability as pets. The aim of this study was to examine how Bengal cats are kept in Belgium and The Netherlands and what potentially problematic behaviour they display. An online questionnaire of 28 questions asked owners for information about their cat, the motivation to acquire it, its home environment, and its potentially problematic behaviours.

Information was collected for 266 cats: 69% from The Netherlands, 22% from Flanders and 9% from Wallonia. Cats were on average 3.5±2.9 (±SD) years old and about 50% were female. The majority of the cats were neutered (86% males and 67% females). For 45% of the cats, the owners did not know to which generation their cat belonged. When owners did know, 93.9% of cats belonged at least to the F5 generation. Temperament (49.2%) and appearance (41.5%) were the main reasons for owners to choose a Bengal cat. 24.3% of cats had outdoor access, either free-roaming or on a leash. Vocalization, climbing, hunting and playing with water were most commonly reported, but these behaviours were not found disturbing by owners. Less frequently occurring behaviours, like house soiling, aggression, and destructive behaviour perturbed owners more.

When comparing our results to literature, the occurrence of potentially problematic behaviour in our sample population of Bengal cats was not excessive. This is probably due to the fact that many cats belonged to the F5 generation or later.

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Introduction to Clinical Ethology in Ferrets

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Conflicts of interest: The author declared there were none
Keywords: ferret, mustelid, clinical ethology, behavioural problems, ferret-human interactions

Ferrets are popular pets in Europe, US and Australia. They are often wrongly described as an exotic or wild species; however, their domestication can be dated at least 2000 years ago to the Roman Empire (1). Understanding their behaviour and behavioural problems related to human-pet relationships has started to bring some attention in this century (2,3). In this review I will introduce some of the biological and ethological background related to the species and the most common behavioural problems. They can be classified mainly as: elimination problems, uncontrolled exploration, and aggressiveness. In a second part I will present a case study about interspecific aggressiveness in ferrets towards humans, one of the most common behavioural problems in ferrets.

More research should be done to understand and prevent behavioural problems in this domestic species, their needs to express natural behaviours, and ferret-human interactions.

REFERENCES

1. CHURCH, B., 2007. Ferret-polecat domestication: genetic, taxonomic and phylogenetic relationships. In J. H. Lewington, ed. *Ferret Husbandry, Medicine and Surgery*. Philadelphia: Saunders Elsevier, pp. 122–150.
2. TALBOT, S., FREIRE, R. & WASSENS, S., 2014. Effect of captivity and management on behaviour of the domestic ferret (*Mustela putorius furo*). *Applied Animal Behaviour Science*, 151, pp.94–101.
3. VINKE, C.M. & SCHOEMAKER, N.J., 2012. The welfare of ferrets (*Mustela putorius furo* T). A review on the housing and management of pet ferrets. *Applied Animal Behaviour Science*, 139(3–4), pp.155–168.

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From feline idiopathic ulcerative dermatitis to feline behavioural self-induced ulcerative dermatitis

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Conflicts of interest: The authors declared there were none.
Keywords: cat, ulcerative dermatitis, behaviour

Feline idiopathic head-and-neck dermatitis - also termed feline idiopathic ulcerative dermatitis (IUD) - is considered to be a rare skin disease of unknown origin (1). It is usually associated with a crusted, non-healing, self-induced ulcer occurring on the dorsal or lateral neck or between the scapula where self-grooming by scratching occurs (2, 3). Usually, IUD is diagnosed after exclusion of other causes of pruritus. In feline medicine, self-induced alopecia is recognized as a behavioural disorder due to excessive licking (4, 5, 6). Such repetitive behaviours could be considered as indicators of poor welfare (7, 8, 9, 10, 11). The objectives of our study were to determine, if the repetitive behaviour associated with self-induced wounds was related to a poor welfare, and, if improving the welfare it would lead to healing.

13 cats diagnosed with IUD by dermatologists were recruited and referred to a behaviourist for welfare evaluation. A welfare score was attributed using a newly-developed 21-point welfare scale. The median score of the 13 IUD cats was 16, while the median score of 35 healthy cats was 7 (Mann-Whitney test $F(df)=47$, $p<0,001$). Major modifications of the cat's environment were then recommended for ill cats. After environment modifications, ulcerative lesions were healed and welfare scores improved significantly (median score of 6, $F(df)=25$, Wilcoxon test, $p<0,001$), being similar to healthy cats (Wilcoxon test, $F(df)=47$, no difference, $P=0,387$). These results suggest that feline IUD is a behavioural disorder indicative of poor welfare and benefitting from management by behaviour specialists.

REFERENCES

1. SCOTT, D. (1990). An unusual ulcerative dermatitis associated with linear subepidermal fibrosis in eight cats, *Feline Practice*, 18(3), pp. 8–18.
2. SPATERNA, A. (2003). Feline Idiopathic Ulcerative Dermatitis: Three Cases. *Veterinary Research Communications*, 27 Suppl. 1, pp. 795–798.
3. MILLER, W. (2013). Miscellaneous skin diseases. In: Muller and Kirk's *Small Animal Dermatology*. 7th edition. St Louis, MO: Elsevier. pp. 718–719
4. SAWYER, L. (1999). Psychogenic alopecia: 11 cases (1993-1996). *JAVMA* 214, 71-74. 493pp.
5. OVERALL, K. (2013). *Manual of clinical behavioural medicine for dogs and cats*. Elsevier St Louis. 442-443.
6. BOWEN, J. (2005). *Behaviour problems in small animals: practical advice for the veterinarian team*. Ed Elsevier Saunders Philadelphia PA, pp. 177-181
7. WÜRBEL, H. (2006). The motivational basis of caged rodents stereotypies. In: Mason, G., Rushen, J. (Eds) *Stereotypic Animal Behaviour. Fundamentals and Applications to welfare*, 2nd Ed. CABI, London, UK, pp. 86-91.
8. FRANCHI, V. (2016). Fur chewing and other abnormal repetitive behaviors in chinchillas (*Chinchilla lanigera*), under commercial fur-farming conditions. *J.Vet. Behav.* 11, 60-64
9. BROOM, D. (1983). Stereotypies as animal welfare indicators. In Schmidt D. Ed *Indicators Relevant to farm animal welfare*. Martinus Nijhoff: The Hague, The Netherlands. pp.81-87
10. LUESCHER, A. (2004). Diagnosis and management of compulsive disorders in dogs and cats. *Clin. Tech. Small Anim. Pract.* 19, pp.233-239
11. MASON, G. (2004). Won't stop, can't stop: Is stereotypy a reliable animal welfare indicator? *Animal Welfare* 13, pp. 57-69.

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Hyperactivity disorder in the mirror of dog-robot interactions

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Conflicts of interest: The authors declared there was no financial or personal relationship with other people or organizations that could inappropriately influence or bias the result of this research

Keywords: dog, hyper-activity, mirror dog robot interactions

INTRODUCTION

Dog-robot interactions (DRI) have been explored as controllable stimuli for evoking particular behaviours in dogs (3). We studied the use of DRIs as an assessment tool for behavioural disorders such as Hyperactivity/Hypersensitivity (HSHA) (1,2).

METHODOLOGY

Behavioural consultations of 21 dogs were recorded, consisting of 10 dogs diagnosed with HSHA disorder, and a control group of 11 healthy dogs. The dogs underwent behavioural examination in a standardized symptoms-based procedure (1) in which they were introduced to a dog-shaped robot of size 10x14x6cm:

Static phase (3 min): placing inactive robot in room centre.

Dynamic phase (3 min): activating the robot to move in fixed circles.

Variables of seconds spent sniffing (nose within 1 cm from toy), and mouthing (oral contact with toy) were recorded using K9-Blyzer (4) and manual tagging with BORIS (5).

MAIN RESULTS

Mann-Whitney U test indicated that mouth_{static} was greater for HSHA group (mean 86.46) than for the control group (mean 38.4) U=27 and p<0.05. In HSHA mouth_{static} was greater than sniff_{static} U=18 p<0.05. Differences in sniff_{static}, sniff_{dynamic} and mouth_{dynamic} between HSHA and control group were not significant.

All HSHA dogs showed interest (mouth+sniff) to both a moving and a static toy. In the control group, 3 dogs showed no interest in a static toy, and 5 dogs showed no interest in a moving toy. All healthy dogs that showed an interest in a moving toy, had previously shown an interest in a static toy.

CONCLUSIONS

Exposure to new objects during behavioural consultations has benefits for supporting diagnosis of HSHA. More research is needed to develop concrete assessment tools.

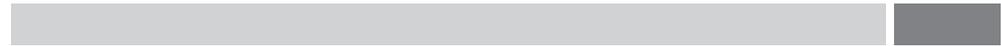
REFERENCES

1. PAGEAT, P., 1998. Pathologie du comportement du chien. Éd. du Point vétérinaire.
2. MÈGE, C., BÉATA, C., BEAUMONT-GRAFF, E., DIAZ, C., HABRAN, T., MARLOIS, N., MULLER, G. 2003. Pathologie comportementale du chien. Masson-AFVAC, Paris, FR.
3. KUBINYI, E., MIKLÓSI, Á., KAPLAN, F., GÁCSI, M., TOPÁL, J. AND CSÁNYI, V., 2004. Social behaviour of dogs encountering AIBO, an animal-like robot in a neutral and in a feeding situation. Behavioural processes, 65(3), pp.231-239.
4. AMIR, S., ZAMANSKY, A. AND VAN DER LINDEN, D., 2017. K9-Blyzer-Towards Video-Based Automatic Analysis of Canine Behavior.
5. FRIARD, O. AND GAMBA, M., 2016. BORIS: a free, versatile open-source event-logging software for video/audio coding and live observations. Methods in Ecology and Evolution, 7(11), pp.1325-1330.

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Caring for food — mutual cooking in animal owners as healthy eating style change and sustainable food practice

B. Beljak

Conflicts of interest: The author declared there were no conflicts of interest. The case study is part of my research as a PhD candidate in Medical Anthropology, Medical University of Vienna. This research includes qualitative interviews and participant observation. It does not include research funding, memberships or any other party in evaluating research.

Keywords: food and feed preparation and production, health, sustainability, animal and humans

Feeding is an interspecies caring process, common in humans and 'other' living beings. Eating habits shape environment including the production of food and feed. Using animal assisted therapy including animal owners, to help form new mutual cooking habits, and using shared meals for animals and humans, could raise awareness of environmentally responsible feeding processes and influence food policy in the future.

Animals and humans develop new approaches to 'gathering' food and caring for 'other' beings. Using old ideas for new trends of eating habits, including growing one's own food and cooking, and then sharing the same ingredients with the augmented family.

In this case study I try to answer questions about what is food and what is feed? Can people be aware of these two 'same ingredients products' when being disconnected from the process of growing food and preparing meals? Why animal owners lose trust in their own knowledge when it comes to feeding animals? Why animal owners don't use natural food for their pets? When it comes to polarizing ethical relationships with animals,

animal owners present a global sensitive population in the process of the re-connection of food with the environment in a 'green' way, caring for the quality of food that they bring to their table, and under the table to their pets. Using animal assisted therapy as a medical cuisine therapy could be a game changer in terms of caring for food in the broader sense of dealing with food related ill-health states like obesity and obesity related diseases.

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Characterization of adopted dogs and cats

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Conflicts of interest: The authors declare that there are no conflicts of interest and there was no funding for this research.

Keywords: dog, cat, choices for companions

INTRODUCTION

Dogs and cats are the pets of choice of humans. Brazil is the second largest "canine nation", with about 23 million individuals (Kostman, 2003)¹. The number of cat owners increases daily and in some European countries the cat population has surpassed the canine population (Marchand&Moore, 1991)².

METHODOLOGY

The authors have published an online questionnaire from August 2016 to February 2018 that included a section on the characterization of adopted dogs and cats, namely, gender, reproductive status, breed, microchip, among others. The authors received 1047 answers and the data were

evaluated to see if there are some characteristics that are more prevalent in adopted animals.

MAIN RESULTS

The data showed that 68% of the cats had been adopted for less than 6 months and 80% for less than 1 year. 69% of the cats had been neutered and only 12% cats were microchipped.

In the case dogs, 44% had been adopted for less than 6 months and 80% for less than 3 years. 49% of the dogs had been neutered and 77% dogs had been microchipped.

PRINCIPAL CONCLUSIONS AND IMPLICATIONS FOR THE FIELD

The responses indicate that adopters have a preference for puppies or kittens. It is also observed that a neutering was more common in cats than in dogs. As far as the microchip is concerned, the perceptions differ on a large scale, since, in Portugal, it is mandatory to chip dogs born after July, 2008. This obligation does not apply to cats.

REFERENCES

1. KOSTMAN, A. (2003). Um caso de amor animal. *Veja*, São Paulo, 24/03/2003. Accessed 8 March 2018 at http://veja.abril.com.br/230403/p_096.html.
2. MARCHAND, C. & MOORE, A. (1991). Pet populations and ownership around the world. *Waltham International Focus*, v. 1, p. 14-15.

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Proposal of a method used in the assessment of welfare in research catteries

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Conflicts of interests: No conflict of interest

Keywords: catteries, cat, welfare assessment, refinement, validity of behavioural research

Cats are involved as research subjects in different fields (1067 cats/year in French laboratories, according to the Statistical Survey 2016). To ensure that valid scientific studies can be carried out, cats need to be monitored both for health and behaviour. This last aspect is very important to prevent problems like stereotypies or other behavioural disorders that could negatively affect their welfare, and the study results.

Legislation and guidelines on animal research set out standards concerning the environment, the stocking density and enrichment (European Directive n°2010/63/UE).

Validated “welfare assessment methods” exist for some species, but to our knowledge little is available in cats. The purpose of this work is to present a standardized method to assess the welfare of research cats, based on the law and on veterinary and ethological knowledge.

A method was created and tested in an experimental cattery of 34 cats. It takes into account different areas: health, behaviour, nutrition, environment and environmental enrichment. For each area different items are evaluated according to a multiple-choice grid. At the end of the assessment a score is given to each area and advice can then be suggested by the assessors.

This “welfare assessment method” is ready to be tested in other catteries.

ries to evaluate its reliability and repeatability. Performing audits on living conditions for animals involved in research and monitoring their quality of life is an important approach to maintain an appropriate level of welfare for these species, and to help guarantee high quality research.

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Bruised Turkey's Wings at Ante-Mortem

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Conflict of Interest: None

Keywords: turkey, abattoir, wing fractures, transport crate design,

One can observe birds being transported in a range of containers to slaughterhouses. The modular system with sliding drawers is used throughout the UK. As birds become larger in size, the height of module drawers remains unchanged. Limited overhead space restricts neck stretching and confinement cramp makes lateral movement difficult.

For turkeys there are two sizes of modules with drawers available, one for stags 550mm and 330mm high for female turkeys.

There is also another form of turkey container which is stackable, manufactured within a metal frame 2.2 metres square, 430mm high with hinged rubber tops, walls of plywood, and ventilated with 25mm holes and lid slits. A recent consignment of 140 female turkeys arrived after a journey of 40 miles, taking an hour and thirty minutes in 330mm high, 1110 x 700mm plastic drawers.

28 of 140 turkeys were observed to have fresh upper aspect of wings lesions, after travel in the 330mm high (plastic drawers). Whereas the plywood containers of 40 turkeys bedded with straw, had no wing lesions in a consignment of 1,400.

The injured turkeys were transported in plastic drawers, where turkey's wings may have been bruised by rubbing on the underside of the drawers above.

The plywood/rubber containers allow birds to be loaded without catching and to travel calmly in darkness.

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Animal welfare in Italian long-term shelters. Benchmark against an “ideal shelter”

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Keywords: animal shelters, dogs, Italy, assessment tool, no kill policy

The No-kill policy for Italian sheltered dogs may result in their permanent detention in long-term facilities with the consequences that the animal welfare can be affected.

A sample of 64 shelters along the Italian North-South axis was assessed with the Shelter Quality Protocol (SQP), an ad hoc tool for the evaluation of shelter dogs' welfare.

The aim of this study was to generate a benchmark of the Italian situation based on the assessments' results. A final scoring system of the SQP was created, based on expert opinion, assigning weights to each principle, criterion, measure and categorical variable included within the protocol. Finally, through specific algorithms, a database was built to calculate automatically the final percentage score of each shelter in respect to the “ideal shelter” (100%).

The 64 shelters were classified by type of management (animal protection associations, municipalities and private organizations/companies) and by geographical area (North, Centre and South).

Shelters managed by animal protection association received a higher score (Mean 83%), followed by shelters directly managed by municipalities (Mean 81%) and then by private shelters (Mean 75%). The shelters situated in the Northern and Central Italian regions received a higher score

(North: Mean 82.5%, and Centre: Mean 81.9%) compared with the shelters from South Italy (Mean 78.3%).

Different management systems and geographical areas provided the level of variability of SQP results. South Italy showed a critical situation regarding animal welfare in long-term shelters. Shelters with high score may be a great opportunity for improvement of other shelters within the same region.

REFERENCES

1. BARNARD, S., PEDERNERA, C., CANDELORO, L., FERRI, N., VELARDE, A., & DALLA VILLA, P. (2016). Development of a new welfare assessment protocol for practical application in long-term dog shelters. *The Veterinary record*, 178(1), 18.
2. CAFAZZO, S., MARAGLIANO, L., BONANNI, R., SCHOLL, F., GUARDUCCI, M., SCARCELLA, R., ... & BUCCI, E. (2014). Behavioural and physiological indicators of shelter dogs' welfare: Reflections on the no-kill policy on free-ranging dogs in Italy revisited on the basis of 15 years of implementation. *Physiology & behavior*, 133, 223-229.
3. MILLER, L., & ZAWISTOWSKI, S. 2015. Housing, husbandry, and behavior of dogs in animal shelters. In: E. Weiss, H. Mohan-Gibbons, S. Zawistowsky (eds). *Animal Behavior for Shelter Veterinarians and Staff*, 145-159
4. TAYLOR, K. D., & MILLS, D. S. (2007). The effect of the kennel environment on canine welfare: a critical review of experimental studies. *Animal Welfare*, 16(4), 435.
5. WELLS D., GRAHAM, L., HEPPEL, P.G. (2002). The influence of length of time in a rescue shelter on the behaviour of kennelled dogs. *Animal Welfare* 11, 317-325

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Correlation between free choice profiling scores and quantitative assessment of elephant behaviour

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Keywords: elephant (*Loxodonta africana* Africana), qualitative welfare assessment, public perception

Qualitative Behavioural Assessment is recognised as a valuable tool in welfare assessment (1). We aimed at assessing whether the presence of specific behavioural patterns (assessed by continuous focal animal sampling) was correlated with the Free Choice Profiling (FCP) description of African elephants (*Loxodonta africana africana*, n=18, 15 videos) by human adults (n=12) and children (n=13). Thirteen behavioural patterns (i.e. walking, standing still, being fed, obeying commands, foraging, self-directed trunk movements, exploratory trunk movements, other trunk movements, ear movements, elimination, head-shaking, pacing, rocking) were included in the ethogram. FCP data were analysed using a specialised GenStat software. A Spearman rank correlation was performed to assess correlations between scores on the first Principal Component Analysis (PCA) dimension axis (characterized by a “playful/happy to sad” axis in both adults and children) and expression of the different behavioural patterns.

The results showed that the animals were perceived as ‘sadder’ by adults the more they expressed behaviours such as standing still (r=0.81,

p=0.0002), showing self-directed trunk movements (r=0.53, p=0.043), and exploratory trunk movements (r=0.55, p=0.032), and the less the animals were walking (r=-0.92, p<0.0001) and less eating (r=-0.67, p= 0.006). Scores given by the children’ group on the first dimension correlated positively with elephants showing other trunk movements (r=0.76, p= 0.001), and pacing (r=0.55, p= 0.032), and negatively with obeying commands (r=-0.60, p=0.018), and being fed (r=0.59, p= 0.021).

In conclusion, active engaged elephants were perceived as more playful/happy, whereas elephants showing repetitive and apparently aimless behaviours were perceived more as sad, even by non-experts.

REFERENCE

1. WEMELSFELDER, F., HUNTER, T. E., MENDEL, M. T., AND LAWRENCE, A. B. (2001). Assessing the ‘whole animal’: a free choice profiling approach. *Animal Behaviour*, 62(2), 209-220.

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Exposure to stress in different categories of racing pigeons at the time of racing

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Conflicts of interest: The authors declared there were none.

Keywords: racing pigeons, stress

INTRODUCTION

Corticosterone is the major “stress” hormone in birds, with short-term changes mediating adaptive behavioural and metabolic responses to deleterious events in the environment (increased effort, transport, predators, food deprivation and climatic conditions) and health status¹⁻⁵. During stressful situations the possibility of infection increases. Clinically asymptomatic infections may flare up later in the breeding season, causing huge losses in a flock⁶.

METHODOLOGY

During the racing season, racing pigeons from four breeders, 24 from each (N=96), were investigated for various stress parameters: presence of disease, conditions at the time of the transport, social influence, and

surrounding facts (predators, storms, high temperatures...) at the time of the race. Four different groups were compared (6 pigeons in each): young pigeons not included in the training (less than one-year-old); young pigeons included in the training but not in middle and long distance races (older than one year up to four years); racing pigeons that were active throughout season (older than one year up to four years); and a sexually mature breeding group of pigeons taking care of their young. The same active racing pigeons were tested again 30 days after the first sample (N=24) for corticosterone. Samples in all groups were taken at daylight within 30 minutes to 5 hours⁷ after racing pigeons returned. Cloacal and oropharyngeal samples were taken to test for circovirus as an indicator of immunosuppression. Levels of corticosterone were analysed using a commercial ELISA, and PCR to detect circovirus⁸.

MAIN RESULTS AND CONCLUSIONS

Preliminary results showed that the corticosterone stress response is affected by numerous factors at the time of race. Among four groups, active racing pigeons were the most stress-exposed group. Pigeon-racing belongs to a group of races leading to animal “exploitation” but not usually to death⁹. It is very important to improve the conditions of races, as in extreme cases less than 10% racing pigeons return. Pigeons under stress are more susceptible to infection and disease levels can increase during and after the season in all pigeons in a flock. Regular monitoring of flock health status is very important and has to be done before and after the active season. Some parameters of stress (environmental temperature, length of race) can be changed in the future with the purpose of reducing the stress and improved pigeon welfare. The results of this study will be presented.

REFERENCES

1. WINGFIELD JC: Modulation of the adrenocortical response to stress in birds. In: Perspectives in Comparative Endocrinology. (Davey KG, Peter RE and Tobey SS, eds.) National Research Council of Canada, Ottawa, Canada, 1994, pp. 520–528.

2. HUMPHREYS EM, Carrington-Cotton A and Wernham CV: A review of an exploratory trial on Sparrowhawk attack rates at pigeon racing lofts in relation to some management practices. BTO Scotland, School of Biological and Environmental Sciences, Stirling, Scotland, 2010.
3. ANGELIER F, PARENTEAU C, TROUVE C AND ANGELIER N: Does the stress response predict the ability of wild birds to adjust to short-term captivity? A study of the rock pigeon (*Columbia livia*). Royal Society Open Science 2016;3:6.
4. HARVEY S, MERRY BJ AND PHILLIPS JG: Influence of stress on the secretion of corticosterone in the duck (*Anas platyrhynchos*). Journal of Endocrinology 1980;87:161-171.
5. SCOPE A, FILIP T, GABLER C AND RESCH F: The influence of stress from transport and handling on hematologic and clinical chemistry blood parameters of racing pigeons (*Columba livia domestica*). Avian Diseases 2002;46:224-229.
6. DOVČ A, KRAPEŽ U, SLAVEC B, ET AL.: Diagnostics of some viral and bacterial diseases in pigeon flocks using air sampler. In: XXII counseling Disinfection, Disinsection and Deratisation with international participation – One World One Health. (Radenković-Damnjanović B, ed.) Faculty of veterinary medicine, Beograd, Kosmaj, 2013, pp. 221-229.
7. BEUVING G AND VONDER GMA: Daily rhythm of corticosterone in laying hens and influence of egg-laying. Journal of reproduction and fertility 1977;51:169-173.
8. DOVČ A, JEREB G, KRAPEZ U, ET AL.: Occurrence of Bacterial and Viral Pathogens in Common and Noninvasive Diagnostic Sampling from Parrots and Racing Pigeons in Slovenia. Avian Diseases 2016;60:487-492.
9. WELLS DL AND HEPPEL PG: Pet ownership and adults' views on the use of animals. Society & Animals 1997;5:45-63.

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Assessing welfare and improving human-animal relationship in beef cattle farms: a case study in France

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Conflicts of interest: The authors declared there were none
Keywords: beef cattle, human-animal relationship, France, welfare assessment

In the context of welfare improvement for farm animals, welfare assessment protocols for farm animals are now available (Welfare Quality¹, AWIN protocols²). However, the welfare quality protocol for cattle is based on assessments for dairy and fattening cattle, but not for lactating beef cattle. Moreover, such protocols are rarely used by breeders on farms in France. In parallel, it is also well known that the human-animal relationship is of a great importance, but in the context of extensive breeding for beef cattle, human-animal contacts are much reduced, and animals may not be habituated to human manipulations.

In that context, we propose to: 1) design a welfare protocol for beef lactating cattle that could be easily performed; 2) design a human-animal relationship assessment protocol; and 3) apply a method for improving human-animal relationships (positive reinforcement, habituation through gentle manipulations).

A breeding farm of 40 beef lactating cows in Charente Maritime (France) has been selected for this study. A preliminary study consisted of evaluating the fear reactions of beef cows before manipulating and trying to enrich

the human-animal relationship. An approach response test was performed (17 individuals) and contact latency was recorded. A protocol consisting of physical (new objects) and social (positive interactions with humans) enrichment was started. A welfare quality score for cattle was designed to test cows before, during, and after this enrichment.

This project will help breeders to better assess the welfare of beef lactating cattle and will propose easy and user-friendly advice to improve human-animal relationships.

References

1. <http://www.welfarequalitynetwork.net/network/45848/7/0/40>.
2. <http://www.animal-welfare-indicators.net/site/>.

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Burnout In Spanish Veterinarians

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Conflicts of interest: The authors declared there were none
Keywords: burnout, Spain, veterinarians

Veterinarians are one group of health professionals with a high incidence of psychological maladjustment. Previous research has focused on other dimensions of psychological adjustment such as depression, stress or anxiety. However, the underlying factors are still somewhat unclear and other dimensions such as burnout need to be more thoroughly explored. Possible protecting factors of burnout and which factors promote higher levels of burnout were identified by using an online questionnaire, that was made available online (Google Docs) and shared on Facebook. This research studied a sample of 932 Spanish veterinarians, predominantly female (73.2%), with an average age of 33.11y (SD = 7.42).

The results indicate that veterinarians with children have significantly lower values of both depression and emotional exhaustion, but the difference was not-significant for professional realisation (achievement).

Gender also seems to play a factor with women reporting significantly higher values of emotional exhaustion but significantly lower values of depression. Concerning professional achievement, men reported significantly higher results. Interestingly, working in shifts, being available on-call 24 hours and working in emergency services had no effect on the level of burnout, but those that worked full time reported significantly higher values of burnout compared to those who worked part-time. Overall, the prevalence of burnout was higher than expected, and although this analysis is not based on a clinical diagnosis, the results should be considered by all relevant stakeholders

REFERENCES

1. DAZA, P., NOVY, D. M., STANLEY, M. A., & AVERILL, P. (2002). The depression anxiety stress scale-21: Spanish translation and validation with a Hispanic sample. *Journal of Psychopathology and Behavioral Assessment*, 24(3), 195-205.
2. FERNÁNDEZ, F. C., MARTÍNEZ, Á. M., MARTÍN, A. B. B., DEL CARMEN PÉREZ-FUENTES, M., JURADO, M. D. M. M., & LINARES, J. J. G. (2015). Prevalencia de la depresión en España: Análisis de los últimos 15 años. *European Journal of Investigation in Health, Psychology and Education*, 5(2), 267-279.
3. HATCH, P. H., WINEFIELD, H. R., CHRISTIE, B. A., & LIEVAART, J. J. (2011). Workplace stress, mental health, and burnout of veterinarians in Australia. *Australian veterinary journal*, 89(11), 460-468.
4. LOVIBOND, P. F., & LOVIBOND, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, 33(3), 335-343.
5. PLATT, B., HAWTON, K., SIMKIN, S., & MELLANBY, R. J. (2012). Suicidal behaviour and psychosocial problems in veterinary surgeons: a systematic review. *Social psychiatry and psychiatric epidemiology*, 47(2), 223-240.

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Farmer awareness and control strategies of feather cover damage in laying hens

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Keywords: laying hens, feather damage, controls

Animal care by farmers can play an important role in reducing welfare problems such as feather cover damage (FD) due to feather pecking. This study explored how awareness among Canadian farmers relates to FD prevalence.

Questionnaires were distributed to 122 laying hen farmers with enriched/non-cage housing systems as part of a larger study. Only questions related to FD awareness and control are considered here. Additionally, farmers assessed 50 birds for FD on the back/rump using a visual scoring tool to determine FD prevalence. Generalized linear mixed models were used to investigate associations between FD prevalence, FD awareness and implementation of management strategies.

Sixty-four questionnaires (52.5% response rate) provided useable information on 65 flocks about FD and animal care. Average FD prevalence was 24.3% (95%CI 16.81–31.81%) with an average flock age of 45 wks (95%CI 41.5–48.7 wks). Forty-two percent of farmers reported seeing hens

with FD, and this was associated with a higher prevalence (+18.5%, 95%CI 4.39–32.69%) based on the on-farm assessment. It should be noted that 56.9% of flocks had an FD prevalence of >5% indicating that some farmers might not be aware FD occurred in their flocks. Of those farmers indicating that they had observed birds with FD, 50% had implemented changes to address this issue.

These results highlight the importance of awareness among farmers of FD prevalence and control strategies to reduce/prevent FD. Further research on effectiveness and timing of control strategies is needed.

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Hens consume excreta of other hens despite excreta-free feed being available

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Keywords: laying hens, coprophagy,

Consumption of excreta likely occurs in laying hens housed in litter-based systems, designed to promote foraging behaviour, where foraging substrate becomes increasingly soiled over time. To date, the implications of this for hen welfare have not been investigated. This study aimed to determine the relative preference of laying hens to consume feed mixed with excreta. Forty-eight 71 wk old White Leghorn laying hens (LSL strain, n=24; UCD-003 strain, n=24) were moved from a litter-based group housing to individual enriched cages. Hens were given daily access to feed mixed with fresh hen excreta (0%, 33%, 66% and 100%) from non-experimental hens kept in the same conditions. Four diets were presented to the hens simultaneously in separate containers (134.3±10.16g diet/container). Following habituation (1 wk), the amount of substrate consumed from each diet was measured over 3 wks to determine the relative preference.

The effect of diet, strain and their interaction on the percentage of substrate consumed was analysed using generalized linear mixed models bird included as the repeated subject. Substrate consumption decreased for both LSL and UCD-003 hens consumed as the percentage of excreta increased (P<0.001), with 69±2.64% consumed from the 0%, 28±3.53%

from the 33%, and finally, $10 \pm 1.01\%$ or $8 \pm 0.32\%$ from the 66% and 100% diets, respectively. On average, this meant that birds consumed 61.3 g of diets containing excreta per day.

Laying hens consume excreta despite excreta-free feed being available. The causes and consequences of this behaviour should be elucidated for appropriate management of foraging substrates in laying hens.

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A behavioural patient from a shelter becomes a police dog

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Conflicts of interest: the author declared there were none.

Keywords: dog, aggression, training

A two-year-old male German Shepherd Cross was admitted to an animal shelter with no history available. The dog showed stereotypic behaviour and severe signs of aggression towards people. When unattended the dog continued to bark and hyper-salivate. The high levels of stress the dog experienced during the night lead to complete exhaustion in the morning time. During regular behavioural consultations the dog initially learned to wear a muzzle. Obedience training was pursued with positive reinforcement. The dog learned that the alternative performance to the undesired behaviour was to sit close to the left leg and watch the handler. In order to reduce the negative influence of the surroundings it was attempted to keep the dog in a foster home. Initially he made good progress and learned fast due to his high play and food drive. The stereotypic behaviour markedly improved; however, the dog continued to show aggression towards people and could therefore not be maintained in a foster home.

It was deemed inappropriate to rehome the dog as a family pet, and if returned to a shelter would necessitate continuous medication. The dog was offered to a police dog trainer who took him on trial. The behavioural therapy and police dog training were pursued concurrently. The dog was subsequently successfully used as an explosives detection dog and now lives in the household of a police dog handler.

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Happy tail syndrome in a sheltered Great Dane

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Conflicts of interest: The author declared there were none.
Keywords: docking, tail amputation, alternatives, Great Dane

A two-year-old male Great Dane was admitted to a shelter in poor body condition with no history available. At the shelter the dog showed continuous aggressive behaviour. Two days after admission a bleeding wound was noted at the tail tip. The wound originated from trauma since the dog repeatedly hit the solid fencing of his pen with its tail tip. The dog showed increasing aggressive behaviour during medical treatment and attempts to bandage the wound were unsuccessful. The wound developed to a chronic stage and amputation of the tail was considered necessary. However, before commencing with surgery we attempted to save the tail by a novel technique. The tail was secured between the hind legs, a soft belt was placed around the dog's waist and a tail segment proximal to the injured site was attached to the ventral aspect of this belt.

With this system/construct in place the wound healed completely within two weeks. The dog showed less signs of stress, and the improvement in the dog's behaviour also meant that it was possible to take him out for walks more frequently. The system did not impair defaecation or urination since the dog was able to move its tail sideways. Once the wound had healed the construct was only placed as a preventative measure in stressful situations. By German law tail amputation should only be performed for a medical reason, and in this case it proved to be unnecessary.

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Technopathies of the limbs in finishing pigs

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Conflicts of interest: The authors certify there were none
Keywords: pigs, fattening, bursae, flooring

Auxiliary bursae are a frequently occurring technopathy in fattening pigs, located on the limbs and sternum of the animals. The aim of the following study was to evaluate the origin and development of auxiliary bursae in course of the fattening period and to determine the influence of flooring systems (fully-slatted floors and alternative variations of flooring systems). 1702 pigs on nine conventional fattening farms were evaluated. Three of the nine farms had fully-slatted floors, two slatted floors, two were PigPort farms and two had straw-bedded flooring. Each farm had been visited twice (beginning and end of fattening period) and 80-100 pigs were examined during each visit. Visual and palpation methods were used to assess prevalence, localisation and severity (score 1-3) of auxiliary bursae.

At the end of the fattening period: 94% of the pigs (56.9 % score 1, 35.0% score 2, 2.1% score 3) on fully-slatted floors; 87.6% (52.1% score 1, 34.5% score 2, 1.0% score 3) in PigPort-Farms; 82.9% (62.6% score 1, 20.3% score 2) on slatted floors; and 50.3% (43.6% score 1, 6.7% score 2) of the pigs on straw-bedded flooring showed at least one bursae. A general linear multi-factor analysis of variance showed that the flooring system had the greatest effect on number of bursae per pig as well as on severity score, followed by age and space allowance.

These results indicate that even reduction of slots in flooring systems can reduce the prevalence as well as the severity of auxiliary bursae in finishing pigs.

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Talking to cows – a comparison of reactions to playback and ‘live’ talking during human-cattle interactions

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Conflicts of interest: All authors declare that they have none. The study was funded by the Austrian Science Fund (FWF).

Keywords: cows, human animal interactions

The quality of the animal-human relationship (AHR) and the affective state of animals can be improved by gentle interactions such as stroking and talking. During experiments, the use of a recording of the verbal stimulus might increase standardisation but it might be perceived differently by the animals than ‘live’ talking, which is closer to practice. We compared heifers’ (n=28) reactions to stroking while an experimenter was talking soothingly (‘live’) or while a recording of the experimenter talking soothingly was played (‘playback’). Each animal was tested three times per condition and results averaged to increase robustness. Each trial comprised three phases: pre-stimulus (baseline, PRE), stimulus (stroking and talking, STROKE), and post-stimulus (POST). In both conditions, similar phrases with positive content were spoken calmly, using long low-pitched vowels. All tests were video recorded and analysed for behaviours associated with different affective states, main variables being neck stretching (STR) and changes of ear position (CHANGE).

In both conditions, CHANGE decreased and STR increased from PRE to STROKE (Wilcoxon test, $p < 0.001$), indicating a decrease of attention and a positive perception of the interactions. When comparing the change from PRE to STROKE between conditions, the duration of STR tended to be longer in the live condition ($p = 0.066$), leading to the conclusion that

stroking with ‘live’ talking may be perceived as more positive than stroking with playback. The difference may be caused by the animals’ perception of the recording or by a change in the experimenter’s body language caused by ‘live’ talking.

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Human-reptile bond and its implication for the welfare of domestic semiaquatic turtles in Portugal

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Conflicts of interest: The authors declare no competing interests.

Aquatic turtles are common pets but are arguably one of the most difficult reptiles to maintain¹ because of species-specific thermal, hydric, dietary and behavioural requirements that call for specialised care². Furthermore, owners' familiarity with reptilian behavioural and psychological health is uncommon³. The purpose of this study was to investigate the welfare of domestic semiaquatic turtles in Portugal and relate it to the human-animal bond. A survey was developed and 114 turtle owners participated (Nov.2017-Feb.2018).

The majority of respondents considered the welfare of their animals as being good or very good (75.4%). Regarding the human-reptile bond, 56.1% of respondents considered their animals to be either a 'family member' or a 'friend'. Those who considered the animal to be a family member/friend were not seen to provide better husbandry conditions such as UVB lamps, heat source or control over temperature ($p > 0.05$ for all). Over one third of owners (35.9%) never took their turtle to a veterinarian. Having a UVB lamp, providing a heat source and having control over temperature were not influenced by having visited a veterinarian ($p > 0.05$ for all).

We conclude that, although most keepers perceive semiaquatic turtles

as family members, talking to them and petting them regularly, basic husbandry requirements are not being adequately met. This puts into question to what extent is the human-reptile bond an indicator of good welfare. Whether the problem is lack of proper information, poor communication between the clinician and the keeper, or mere negligence are questions that call for additional research.

REFERENCES

1. WAPPEL, S.M. AND SCHULTE, M.S. (2004). Turtle care and husbandry. *Veterinary Clinics of North America: Exotic Animal Practice*, 7, pp. 447–472.
2. GRANT, R.A., MONTROSE, V.T. AND WILLS, A.P. (2017). ExNOTic : Should We Be Keeping Exotic Pets ? *Animals*, 7(6), p.47.
3. WARWICK, C. ARENA, P., LINDLEY, S., JESSOP M., AND STEEDMAN, C. (2013). Assessing reptile welfare using behavioural criteria. *In Practice*, 35(3), pp. 123–131.

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Blood biochemical parameters in free-ranging red deer (*Cervus elaphus elaphus*) after chemical and physical restraint

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Conflicts of interest: None to declare

Keywords: aminoacyl-imidazole dipeptides, animal welfare, red deer, *Cervus elaphus elaphus*, restraint, stress

For red deer (*Cervus elaphus elaphus*), capture can be extremely distressing, even leading to death. The aim of the current study was to compare the state of welfare in red deer restrained by chemical and physical methods after capture. This opportunistic study was carried out involving animals captured and clinically assessed in order to be moved for restocking other parks. Eighteen red deer were captured in box traps and then restrained in an immobilizing box (physical restraint) and three red deer were captured twice, once by anaesthetising them (chemical restraint, Xylazine/Tiletamine/Zolazepam using a dart) and once in the immobilizing box. Blood samples were taken and biochemical parameters were measured. In addition, plasma aminoacyl-imidazole dipeptides and their related compounds (carnosine, anserine, L-histidine and 3-methyl-L-histidine), were measured as possible indicators of muscle damage relating to capture. Data were analysed using a PERMANOVA ($p < 0.05$)

It was found that micro haematocrit, total erythrocyte and leukocyte

numbers, and plasma cortisol were higher after physical compared with chemical restraint. Anserine and 3-methyl-L-histidine plasma concentrations were significantly higher after the physical restraint in red deer subjected to both capture methods.

The data we obtained support previous studies indicating that capture by physical restraint is more stressful than chemical restraint. The data also suggest that measuring plasma aminoacyl-imidazole dipeptides and related compounds may provide useful information to measure stress in animals prone to capture myopathy.

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Three years of research on manipulable materials in Italian heavy pig production: a synopsis

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Conflicts of interest: The authors declare that they have no competing interest. The research was funded by Progetto AGER, grant n°2011-0280

Keywords: Italian heavy pigs, manipulable materials, slatted floors, behaviour

The effects of manipulable materials on the behaviour of growing-finishing undocked Italian heavy pigs (30-170 kg BW) were studied in 168 animals in 4 independent trials. The materials studied were: 1) suspended metal chain; 2) wood logs inside a rack; 3) edible block inside a rack, 4) wood attached to a metal chain; 5) wood log held by a metal frame; and 6) edible block held by the frame. In each experiment two of the above-mentioned enrichments were compared. Animals were kept in small groups (4 pigs/pen) on slatted floors. Pigs were videotaped over the diurnal hours (12h) approximately every three weeks. Individual behaviours were assessed by scan-sampling. Observations from the 4 trials (1400 individual ethograms) were subjected to one-way ANOVA, using the enrichment device as the main effect and the trial as the random effect.

All animals were in good health throughout the trials. None of the proposed six enrichment devices significantly ($P > 0.05$) affected the main individual behavioural patterns (proportion of time committed to: standing inactive, sitting inactive, lateral lying, sternal lying, rooting/exploring). The most observed behaviour was lying, ranging from 61 to 73%. No aggression or tail biting outbreaks were recorded. Conversely, depending on the trial, some unknown experiment-related factors resulted in significant differences for all the observed behaviours. Given the similarities in terms

of general behaviour shown by pigs under good rearing conditions, it is suggested that factors other than enrichment devices may play an important role in the welfare of heavy pigs.

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Palliative sedation as alternative to pet euthanasia

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Conflicts of interest: The authors declare that they have no competing interests.

Keywords: euthanasia, palliative, death, ethical decision

When considering a request to euthanise a pet, the ethical, legal and clinical issues must be taken into consideration. The necessity to alleviate animal pain and suffering have to be counterbalanced by the owner's willingness to deal with time consuming care procedures and expensive therapeutic cycles.

On the other hand, the critical decision to euthanise their pet may elicit a feeling of anxiety in the owner. Veterinarians classified pet owners' troubling emotions into two main categories: those associated with grief (e.g., sadness, distress) and those associated with guilt (e.g., doubt, regret) (1). Another element arise, and that is handling ethical dilemmas, regarding euthanasia seems also to cause serious psychological problems and stress to the veterinarians themselves (2).

This feeling may be compounded by the Italian law that punishes "anyone who kills an animal without necessity" and, then again, who does not take care of their own animals assuring them adequate medical care (3)?

On a case-by-case basis, the veterinarian may propose to the pet owner a "palliative sedation" (PS) protocol as an alternative to euthanasia to manage, in a highly professional manner, the end of an animal's life.

This option should be considered only when it is aimed to reduce the patient's consciousness of severe symptoms which are intractable and intolerable (e.g. extreme pain, dyspnoea, etc.), or when the animal has a terminal prognosis such as a chronic progressive disease (e.g. end-stage renal disease, congestive heart failure), or a chronic disability (e.g. irreversible paresis) or a terminal geriatric status (blindness, deafness, inability to move autonomously etc.).

In fact, according to the provisions of the Italian Code of professional conduct for veterinary surgeons, the veterinarian has an ethical and moral obligation to prevent suffering of the animals and to preserve quality of life by limiting side effects of a disease. A veterinarian must clearly inform a pet owner about a disease condition and how it may progress, by helping him/her, in this manner, to understand the disease process and consequently to facilitate informed decision making (4).

In terminal cases that require meeting the pet's physical needs during its progression towards death, owners are being asked to rethink the situation and to provide Palliative Sedation.

At the same time, veterinarians should meet a client's emotional needs and have respect for the human-animal bond, implementing a plan that works for both animals and owners.

PS is ethically acceptable if the following points are met: i) the administered medication offers legitimate patient benefits; ii) the owner does not feel the necessity to put down his/her pet; and iii) animal death is expected as imminent (hours or days, not weeks or months).

In relation to this last point, when a pet develops a terminal disease and is approaching death, this obligation becomes even more important and in the time between identifying a terminal diagnosis and death, the animal needs and deserves PS.

Education of owners by the veterinarian is essential to help them address the needs of their terminally ill pet.

This includes a team-wide understanding of pain pathophysiology and pain evaluation and examination techniques and a general understand-

ding of how pain is treated (5). Even though diagnosis and prescribing medications are the veterinarian's responsibility, the technical team can serve as a critical link among veterinarian, patient and client. Team training should include the following skills: a) Performing a pain evaluation of pet, understanding differences among species; b) Using a pain scoring system or scale; c) Offering wound care; d) Developing communication skills to enhance veterinarian-client interactions; e) Learning management methods of safe medication process in home health care.

REFERENCES

1. MORRIS, P. (2012). Managing pet owners' guilt and grief in veterinary euthanasia encounters. *Journal of Contemporary Ethnography*, 41, 337-365.
2. BONINI S., BUONACUCINAA., SELIS L., PELIA., MUTTIA., COR-RADI M. (2016). Occupational Hazards in Veterinarians: An Updating. *Journal of Veterinary Science & Technology* 7: 317.
3. ITALIAN CRIMINAL CODE. R.D. 19/10/1930 n. 1398. art. 544bis and art 544 ter.
4. PASSANTINO A., QUARTARONE V., RUSSO M. (2012). Informed Consent In Italy: Its Ethical And Legal Viewpoints And Its Applications in Veterinary Medicine. *Annual Review of Biomedical Sciences*, 14, 16-26.
5. PASSANTINO A., FAZIO A., QUARTARONE V. (2012). Pain in veterinary medicine in the new millennium. *Theoretical Biology Forum*, 1, 77-85

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What's new? Individual variation in response to novelty in minipigs (*Sus scrofa domesticus*)

P. Perez Fraga

Exploration of the environment is a normal species-specific, behaviour performed by pigs, necessary for food searching, familiarization with the surroundings (3), and as result for their welfare (4).

Moreover, sensor devices are a tool for animal health and welfare monitoring (1) (2).

The aim of this study is to assess individual variation in family pigs response to novel environment, based on their locomotor activity measured by a motion sensor device. We hypothesized that there was an individual variation in pigs' response to novelty, which was consistent in time.

We tested a group of pigs (n=10) living in human families, both sexes, at 3, 5, and 7 months. We used 3 different, novel rooms, with different objects on the floor. In every room, the pig was let free to explore, in the presence of the owner. We've recorded the behaviour by means of video cameras and a harness-worn motion sensor device.

Preliminary results show that from an early age, pigs are explorative in new environments and, in line with our hypothesis, there is an individual variation in pigs locomotive explorative behaviour which is consistent in time and can be measured automatically by a behaviour tracker device.

In conclusion, despite being explorative from an early age on there exist individual differences in pigs' response to novelty that should be taken into account when providing them with the opportunity of exploring new environments. These results further stress the opportunities that lie in the usage of animal-worn behaviour tracker devices for welfare status monitoring.

REFERENCES

1. STUDNITZ, M., JENSEN, M. B., & PEDERSEN, L. J. (2007). Why do pigs root and in what will they root?: A review on the exploratory behaviour of pigs in relation to environmental enrichment. *Applied Animal Behaviour Science*, 107(3), 183-197.
2. BEATTIE, V. E., WALKER, N., & SNEDDON, I. A. (1995). Effects of environmental enrichment on behaviour and productivity of growing pigs. *Animal Welfare*, 4(3), 207-220.
3. NAGL, L., SCHMITZ, R., WARREN, S., HILDRETH, T. S., ERICKSON, H., & ANDRESEN, D. (2003, SEPTEMBER). Wearable sensor system for wireless state-of-health determination in cattle. In *Engineering in Medicine and Biology Society, 2003. Proceedings of the 25th Annual Kwong*,
4. H., WU, T. T., GOH, H. G., SASLOGLOU, K., STEPHEN, B., GLOVER, I., ... & ANDONOVIC, I. (2012). Practical considerations for wireless sensor networks in cattle monitoring applications. *Computers and Electronics in Agriculture*, 81, 33-44 International Conference of the IEEE (Vol. 4, pp. 3012-3015). IEEE.
5. CHAMPAGNE, F. A., & MEANEY, M. J. (2007). Transgenerational effects of social environment on variations in maternal care and behavioral response to novelty. *Behavioral neuroscience*, 121(6), 1353.
6. GERENCSEI, L.; VASAERHELYI, G.; NAGY, M.; VICSEK, T.; MIKLOS, Á.; 2013. Identification of behaviour in freely moving dogs (*Canis familiaris*) using inertial sensors. *PLOS ONE*, 8 (10): e77814

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Effects of feeding enrichment on the behaviour and welfare of captive wolves (*Canis lupus lupus*)

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Conflicts of interest: None to declare. Partially sponsored by Aussiedog
Keywords: Animal welfare, wolf (*Canine lupus lupus*) behaviour, feeding enrichment, zoo

In captive carnivores, frustration and stress may arise from the impossibility to perform foraging and predatory behaviours. This study aimed to assess the effects of two feeding enrichment programs on captive wolves.

Four male wolves, 7.7±0.5 years old, housed at the Bioparco in Rome, underwent an experimental protocol composed of four phases, each lasting two weeks: basal control, hidden food, novel objects containing food, and final control. Each wolf was observed every day in three 1-hour observation sessions performed in the following conditions: pre-feeding, during feeding, and post-feeding. Data were collected by 1 minute-interval instantaneous scan sampling. For each wolf, activity/inactivity levels, exploratory behaviour, quality of social interactions and stereotypic behaviour were recorded. Each wolf acted as his own control, and his behaviour in the four different phases was compared using the Wilcoxon test ($p < 0.05$).

No significant differences were found in activity/inactivity levels between phases. On the contrary, exploratory behaviour increased for all subjects when novel objects were provided. Quality of social interactions improved for three of the four wolves. For one of them, rates of positive social

interactions increased when food was hidden. For the other two wolves, rates of negative social interactions decreased with the provision of novel objects. Furthermore, providing novel enrichment objects also decreased stereotypic behaviour rates in two out of four wolves.

Despite the high inter-individual variability, wolves responded positively to both feeding enrichment programs. However, providing novel enrichment objects seemed to be more effective than hiding food at enhancing our wolves' level of welfare.

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Effect of rubber mats on behavioural and health indicators in weaning and fattening Italian heavy pigs

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Keywords: weaner pigs, fattening pig, tail biting, ear biting, cleanliness, rubber mat.

Flooring may affect animal welfare, in particular, solid floors could improve comfort during resting (1).

This study aims to test the effectiveness of rubber mats in improving welfare of weaning and fattening Italian heavy pigs.

A total of 320 weaning (6-30 kg) and fattening (30-160 kg) pigs, reared in province of Mantova (Italy), were monitored from May 2017 to February 2018.

Experimental groups comprised two pens for weaners (plastic-slatted floor) and two pens for fatteners (concrete-slatted floor), modified with rubber mats (covering 33% and 50% of floor, respectively). An experimental group was compared with a control group of two pens with a plastic fully-slatted floor for weaning pigs, and two pens with a concrete fully-

slatted floor for fattening pigs. The stocking density was in accordance with Council Directive Council Directive 2008/120/EC.

Data were collected twice during weaning period (5 days after entry into the pens and one week before the animals were moved to the fattening house) and three times during the fattening period (5 days after entry into the pens, in the middle of experimental period and one week before slaughter).

To determine the effect of rubber mats on behaviour, general time budgets (use of enrichment, manipulation of pen and pen components, aggressive interactions, other interactions, feeding, drinking, standing, lying, other behaviours) were compared between groups. Direct observations were made during two 1-hr periods (8:00-9:00am and 11.00:12:00pm) using scan sampling. At each 10-min interval, the numbers of pigs performing behaviours listed above were counted. The results were analysed as percentages of the total number observed. At the third and sixth scan, the location of lying pigs in the pen was identified to assess the use of rubber mats for resting behaviour.

Health indicators – wounds on body, tail and ear biting and manure on the body – were collected at the same time-points using valid scoring systems (2,3 for ear biting). Pen fouling was also evaluated.

The assessor had been previously trained to perform behavioural observations and an assessment of health indicators. Statistical analyses of the data were performed using analysis of variance (SPSS Statistics 21).

No effect of rubber mats was observed in weaners for health indicators, although tail and ear biting were present with a high prevalence in both groups (more than 7% of score 2 of tail biting and more than 5% of score 1 of ear biting).

Pen fouling was not significantly different between groups, while the experimental group at fattening was significantly dirtier ($P < 0.001$). The type of flooring, and in particular a portion of solid floor, has a negative effect on pen fouling and body cleanliness (4,5).

Considering statistical differences in behaviour: pigs in the experimental group were less lying inactive ($P < 0.01$) than ones in the control group. These results are contrary to what was expected (6) and indicate that the

portion of solid floor with rubber mats had no effect on positively modifying lying behaviour, or on the use of space for resting.

In conclusion, the minimum space allowance required by EU legislation and the design of traditional fattening pens without separation between different functional areas, makes it difficult to create a comfortable and clean resting area by using rubber mats. During the weaning period, a portion of solid floor seems not to be enough to improve the welfare of pigs in terms of reducing tail and ear biting.

REFERENCES

1. EFSA. (2005). The welfare of weaners and rearing pigs: effects of different space allowances and floor types. European Food Safety Authority, AHAW panel. The EFSA Journal, 268, pp.1-19.
2. WELFARE QUALITY®. (2009). Welfare Quality® assessment protocol for pigs (sows and piglets, growing and finishing pigs). Lelystad, Netherlands: Welfare Quality® Consortium.
3. ADAMI, L.C. (2014). Materiale manipolabile nella fase di svezzamento del suino: rilievi sanitari e comportamentali. Specialisation thesis in Swine Pathology, University of Milano, 2013-2014.
4. MINVIELLE, B., LE ROUX, A., BOULARD, J., CATARINA, A., BOUYSSIERE, M. (2005). Influence du mode d'élevage sur la propreté visuelle des porcs et la contamination microbiologique des porcs et des carcasses. Journées Recherche Porcine, 37, pp. 99-106.
5. ROSSI, R., COSTA, A., GUARINO, M., LAICINI, F., PASTORELLI, G., CORINO, C. (2008). Effect of group size-floor space allowance and floor type on growth performance and carcass characteristics of heavy pigs. Journal of Swine Health and Production, 16, pp.304–311.
6. PETHERICK, J.C. (1983). A biological basis for the design of space in livestock housing. In: S.H. Baxter, M.R. Baxter, J.A.C. MacCormack, eds., Farm Animal Housing and Welfare, Martinus Nijhof, Dordrecht, pp. 103–120.

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Multidisciplinary Educational Approach for Improving the Well-being of Cats and Dogs in a family setting

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Keywords: Human family, animal welfare, multi-disciplinary education

It is very important to protect and improve the emotional health of pets and to sustain a reliable relationship with them. Therefore, products for optimizing animals' lives have a significant impact on their well-being in the home environment. It is important to provide affordable and sustainable solutions to encourage owners to use these products. A student project was carried out by two research teams from the Department of Industrial Design, Middle East Technical University and Faculty of Veterinary Medicine, Ankara University. The main purpose of the project was to develop products for families aimed at improving the welfare of cats and dogs in the home environment. Undergraduate students from the Department of Industrial Design were expected to design a product that comprised products for different activities such as feeding, exercise, and play for cats and dogs. Students were expected to consider the demands of the purchasers, i.e. owners, animals' daily routines, physical needs and behavioural patterns, as well as the animals' emotional and instinctive motivations.

The project was carried out with eight teams including 24 students, in total. The project took 8 weeks and included several stages: such as a seminar given on "dog and cat behavioural needs" at Ankara University Faculty of Veterinary Medicine to provide background for developing the product; understanding user needs and behaviours, supporting idea generation; and guiding design detailing activities. During the project, the teams

were evaluated by a preliminary jury, testing their projects with animals, and received feedback from owners. Taking this feedback into consideration, the students finalized their projects and were then evaluated by a final jury including the course instructors, other tutors from the Department of Industrial Design at METU, and previously consulted experts from Ankara University Faculty of Veterinary Medicine, Department of Physiology.

At the end of the project, eight family products for indoor cats, pet dogs and guide dogs were developed by the students. This project showed that a multi-disciplinary approach could be an efficient way to develop products for improving animal well-being.

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Evaluation of the relevance of sex hormones in the faeces of the Hermann's tortoise (*Testudo hermanni*) by the ELISA method

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Evaluation of reproductive activity and hormone monitoring are an effective and useful tools for the breeding management in different species.¹ Advantages of fecal steroid measurements include the stress-free and non-invasive collection of multiple samples from the same individual over a long period of time.² In tortoises, the gender can be morphologically determined few years after hatching. The aim of this study was to assess the usefulness of the amount of sex hormones in faeces of young tortoises smaller than four years to distinguish among their genders.

Hermann's Tortoises, four males and four females were over 26-year-old. Four undefined gender individuals were captive born and were 3 and 4-year-old. The frequency of faecal sample collection ranged from once to twice a week from mid-May till the start of October. Samples (N=131) were stored at -20°C until analysis for hormone metabolites. Progesterone, oestradiol and testosterone were extracted from faeces.³ In addition, concentration hormones were analysed using enzyme immunoassays according to the manufacturer's instructions.

Huot-Daubremont et al.⁴ analysed plasma sex steroid hormones in Hermann's tortoises. Our results of the same hormones detected in faeces are similar to theirs. Progesterone levels in males raised right after egg-laying. In females, levels were the highest prior egg-laying's with values ranging from 32.23 to 137.01 ng/ml. The highest levels of oestradiol in males were found before egg-laying. Female levels at the onset of the period of laying were from 260.98 to 1711.50 pg/ml. The highest levels of testosterone were observed in males right after egg-laying. In females' testosterone was also variable at the onset of the period of laying with values ranging from 3.93 to 10.67 ng/ml.

Our results show that this approach is not useful method for determination of gender in tortoises younger than four years. However, this method may be used to establish activity of hormones in adult Hermann's tortoises.

REFERENCES

1. SCHWARZENBERGER F AND BROWN JL: Hormone monitoring: an important tool for the breeding management of wildlife species. *Wiener tierärztliche Monatsschrift* 2013;100:209-225.
2. TOUMA C AND PALME R: Measuring fecal glucocorticoid metabolites in mammals and birds: the importance of validation. *Annals of the New York Academy of Sciences* 2005;1046:54-74.
3. WALKER SL, WADDELL WT AND GOODROWE KL: Reproductive endocrine patterns in captive female and male red wolves (*Canis rufus*) assessed by fecal and serum hormone analysis. *Zoo Biol* 2002;21:321-335.
4. HUOT-DAUBREMONT C, BRADSHAW SD, BRADSHAW FJ, KUCHLING G AND GRENOT CJ: Variation of plasma sex steroid concentrations in wild and captive populations of Hermann's tortoise (*Testudo hermanni hermanni*) in Southern France. *General and comparative endocrinology* 2003;130:299-307.

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Pilot study on the effect of classical music played with an audio ear net on the stress of horses during medical X-Ray examinations

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Conflicts of interest: Emmanuelle Titeux and Caroline Gilbert are unpaid members of the scientific committee of the audio ear net company. Audio ear hardware was loaned by the company for this study.

Keywords: horse, animal welfare, music, clinical examinations

Classical music can reduce psychological and physiological stress in humans under hospital conditions (1,2). Its positive effects on stress have been shown for captive animals: several species of primates, rats, mice, elephants and dogs (3-7). For the horse, studies have shown that classical music reduces stress at stables but also during stressful situations (8-10). It may also be an efficient tool during stressful veterinary manipulations, like X-Ray examinations, to decrease stress of horses and improve their welfare.

To investigate this hypothesis, we compared facial expressions, the frequency and occurrence of behaviours associated with stress, and the RR intervals of 16 horses during X-ray examinations. Horses were separated into three groups: Group 1: wearing the ear net with music; Group 2: wearing this ear net but without music; and Group 3 without wearing the ear net and not exposed to music.

No significant differences were shown between the 3 groups (Mann-Whitney test $F(df)= 15, p>0.05$). A lack of statistical power or no effect of the classical music under our conditions would explain these results. Other studies are needed to investigate classical music interest in horses under veterinary examination conditions.

REFERENCES

- MORIS D., LINOS, D.(2013). Music meets surgery: two sides to the art of « healing ». *Surg. Endosc.* 2, pp. 719-723.
- COLE L.,LOBIONDO-WOOD, G. (2014) Music as an Adjuvant Therapy in Control of pain and Symptoms in Hospitalized Adults: A Systematic Review. *Pain. Nurs.* 15, pp. 406-425.
- WELLS, D. GRAHAM L., HEPPEP, P. (2002). The influence of auditory stimulation on the behaviour of dogs housed in a rescue shelter. *Anim. Welf.*11,pp. 385-393.
- KOGAN, L SCHOENFELD-TACHER R., SIMON A 2012). Behavioral effects of auditory stimulation on kennelled dogs. *J. Vet. Behav. Clin. Appl. Res.* 7, pp. 268-275.
- PATTERSON-KHANE, E. FARNWORTH, M (2006). Noise Exposure, Music, and Animals in the Laboratory: A Commentary Based on Laboratory Animal Refinement and Enrichment Forum (LAREF) Discussions. *J. Appl. Anim. Welf. Sci.*, 9, pp. 327-332.
- ALWORTH, L., BUERKLE, S.2013). The effects of music on animal physiology, behavior and welfare. *Lab Anim.*42, pp. 54-61.
- WILSON, M. PHILLIPS,C. ,LISLE, A., ANDERSON S., BRYDEN W., CAWDELL-SMITH, A.(2011). Effect of music on the behavioural and physiological responses of stabled weanlings. *J. Equine Vet. Sci., Proceedings of the 2011 Equine Society Symposium*, 31, pp. 321-322.
- CARTER, C., GREENING, L. (2012). Auditory stimulation of the stabled equine, the effect of different music genres on behaviour. *Proceedings of the 8th International Equitation Science Conference, Royal (Dick) Veterinary School, Edinburgh*, p167.
- NEVEUX, C. FERARD, M., DICKEL, L., BOUET, V., PETIT, O.,VALENCHON, M. (2016). Classical music reduces acute stress of domestic horses. *J. Vet. Behav. Clin. Appl. Res.*, 15, p 81.

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New housing in horses: are “paddock paradise” and “active stables” really improving welfare?

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Conflicts of interest: The authors declare none.

Keywords: horses, housing, animal welfare

Current management practices for horses are driven by human requirements and cost limitations, but often ignore basic equine needs (1). Horses housed in stables are offered an environment far from their natural environment, which does not allow the expression of a normal behavioural repertoire or a regular activity budget (2). For several authors these living conditions are correlated with behavioural disorders in particular stereotypies (3-6). On the other hand providing pasture and social interactions improve horse welfare (7) measured by a cognitive positive bias (8). For this reason new housing systems are being proposed to horse owners.

In this poster, we discuss 2 different concepts: Paddock Paradise (9) and active stables (10). Up to now, these housing systems have not been scientifically assessed and are often ignored by veterinarians. In order to be aware of these housings, this study reviews these two concepts by using the AWIN (11) approach designed to measure welfare in group housed horses. Shelters, access to food and water, activity budget, social interactions, beddings, and costs are assessed. It is clear that more scientific investigations need to be done on such systems. When carried out in good conditions, both concepts can be good alternatives to stable housing and should be recommended by veterinarians who propose a behavioural therapy including enrichment.

REFERENCES

1. VAN DIERENDONCK, M. SPRUIJT, B.(2005) Social contact in horses: implications for human–animal relationships. In: de Jonge, F., van den Bos,

2. RIVERA, E., BENJAMIN, S., NIELSEN, B., SHELLE, J., ZANELLA, AJ. (2002). Behavioral and physiological responses of horses to initial :the comparison between pastured versus stabled horses; *Appli.Anim. Behav. Sci* 78, pp 235-252.
3. COOPER, J., MASON, G.(1998). The identification of abnormal behaviour and behavioural problems in stabled horses and their relationship to horse welfare: a comparative review. *Equi. vet.Journ.suppl.*27, pp 569.
4. CHRISTENSEN, J., LADEWIG, J., SONGERGAARD,E., MALM-KVIST, J. (2001). Effects of individual versus group stabling on social behaviour in domestic stallions. *Appli. Anim. Sci.*75, pp 233-243.
5. WATERS, A., NICOL, C., FRENCH, N(2002). Factors influencing the development of stereotypic and redirected behaviours in young horses: Findings of four year prospective epidemiological study. *Equi.Vet. Journ.*34(6), pp 572-579.
6. BACHMANN, I., AUDIGÉ, L., STAUFFACHER, M. (2003). Risk factors associated with behavioural disorders of crib-biting weaving and box-walking in Swiss horses. *35(2)*, pp 158-163.
7. YARNELL; K., HALL, C., ROYLE, C., WALKER, S.(2015); Domesticated horses differ in their behavioural and physiological responses to isolated and group housing. *Physiology and Behavior.* 143, pp 51-57.
8. LÖCKENER, S., REESE, S., ERHARD, M., WÖHR, AC.(2016). Pasturing in herds after housing in horseboxes induces a positive bias in horses. *Jour.vet behav.* 11, pp 50-55.
9. JACKSON, J.(2007). Paddock Paradise: a guide to natural horse boarding. Star Ridge Publishing.ISBN 0-9658007-8-4.
10. ACTIVE STABLES, (2018). Aktivstall official website.(online) Available at: <https://aktivstall.de/en/> (Accessed 21feb. 2018)
11. AWIN, (2018). Awin official website. (online) Available at: <http://www.animal-welfare-indicators.net/site/flash/pdf/AWINProtocolHorses.pdf> (Accessed 21feb. 2018)

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Biosecurity as a welfare component in broiler farms: How it is related to the prevalence of resistant strains of *Escherichia coli*

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Conflicts of interest: The author declare none.

Keywords: Biosecurity, animal welfare, resistance strains
E. coli, antimicrobials, broiler chicken flocks

Biosecurity plays a key role in preventing the spread of infectious diseases that can threaten animal welfare. The aim of this study was to investigate the prevalence of resistant strains of *Escherichia coli* in broiler flocks as related to biosecurity measures. The research was carried out on 299 broiler houses, randomly selected from 71 intensively producing poultry farms. Faecal samples were collected using sterile swabs and then cultured in Tryptone Bile X-Glucuronide (TBX) medium for the isolation of *Escherichia coli*. The isolates were tested for their sensitivity using the Kirby-Bauer Disk Diffusion Susceptibility Test for 16 antimicrobials. Independent χ^2 test was applied to statistically relate antimicrobial resistance with 4 factors: (a) the presence of an anteroom, (b) the presence of a foot bath at the entrance to broiler house, (c) the presence of hygiene equipment such as hand soap and disinfectant, and (d) the use of uniforms by staff.

The presence of anteroom was found to have statistical significance ($P \leq 0.05$) on ciprofloxacin, amoxicillin-clavulanic acid and nalidixic acid resistance. The hygiene equipment was significantly ($P \leq 0.05$) correlated with the amoxicillin-clavulanic acid, chloramphenicol and cefotaxime resistance. Antimicrobial resistance was statistically different ($P \leq 0.05$) when staff used or did not use uniforms for ceftriaxone, cefpodoxime and cefotaxime. Finally, the presence of foot bath was statistically ($P \leq 0.05$) related to resistance to ciprofloxacin, chloramphenicol, tetracycline, nalidixic acid

and ceftazidime. This study presents preliminary results of a PhD thesis in progress aiming to investigate the prevalence of resistant strains of *Escherichia coli* producing β -lactamases in relation to on farm welfare.

REFERENCES

- HUIJBERS, P.M.C. (2014) Extended-spectrum and AmpC β -lactamase-producing *Escherichia coli* in broilers and people living and/or working on broiler farms: prevalence, risk factors and molecular characteristics. *J Antimicrob Chemother* 2014; 69: 2669–2675.
- PERSOONS, D. (2010) Risk factors for ceftiofur resistance in *Escherichia coli* from Belgian broilers. *Epidemiol. Infect.* page 1 of 7.

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Perspective of the portuguese society towards bullfights

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Conflicts of interest: This poster has not been presented or accepted at any other national/international congress or meeting.

Keywords: Bullfighting, Portuguese society, tradition, culture, animal rights.

Throughout human history, coexistence with animals has always been a reality. They have been used for company, food, clothing, transportation, experimentation, and for entertainment as in zoos, or in shows such as circuses and bullfights (Broom & Fraser, 2010)¹. Science has shown that animals are sentient beings, with sensitivity, intelligence and that they experience suffering. The similarities between the human nervous system and those of many other non-human species support this reasoning (Galvão, 2011)².

Generally, bullfights are performances associated with different backgrounds, such as cultural, charity, tourism or commercial. However, although traditional and cultural values are usually alleged as justification for maintaining bullfighting practices, animal rights and animal welfare are

increasingly being considered. Although bullfights in Portugal have existed since the beginning of the thirteenth century, they have always divided Portuguese society between bullfighting supporters and opponents, and bullfights have been prohibited several times. This research is intended to evaluate Portuguese society today towards bullfighting.

For that purpose, a survey was developed by animal welfare and behaviour scientists, bullfighting professionals and statisticians, and distributed on-line between December 2016 and March 2017. During this period 8377 valid responses were received.

Most of the respondents (71.2%) had not attended or participated in any type of bullfighting in the previous year, stating that the main reason for this (76.6%) was a concern for animal welfare. More than half of the respondents considered that bullfighting should not be continued in Portugal (66.7%). Most of those who considered that it should be retained claim that it is part of the Portuguese tradition (96.8%).

These results suggest a concern for animal welfare and a move away from the bullfighting in this sample of Portuguese society, and that the main reasons for maintaining this practice are cultural values and a strong Portuguese tradition over the past centuries.

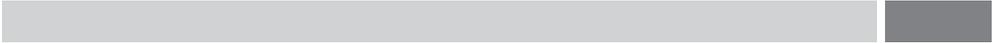
REFERENCES

1. BROOM, D. M., & FRASER, A. F. 2010. Comportamento e bem-estar de animais domésticos, Barueri: Manole.
2. GALVÃO, P. 2011. Os animais têm direitos? Perspectivas e argumentos, Lisboa: Dinalivro.

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POSTER

Behavioural Medicine

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Prescription of psychotropic drugs for dogs during New Year's Eve by Austrian and German veterinarians and their attitudes to noise aversion

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Conflicts of interest: The author declared none. The research was self-funded.

Keywords: Dogs, noise, psychotropic drugs, survey on veterinarians' attitudes

Noise aversion is a common behaviour problem highly relevant to dog welfare. Our aim was to investigate choice of psychotropic drugs and attitudes of veterinarians to treatment of noise aversion.

An online-survey was started in January 2018 in German-speaking countries. Preliminary data from 221 veterinarians (77% female) with a mean age of 46±9 years from Austria (70%) and Germany (30%) are reported.

The most commonly prescribed drugs for noise aversive dogs during New Year's Eve were Alprazolam (never: 44%/often: 28%) and Acetylpromazine (38%/20%), followed by Dexmedetomidine (54%/15%). Some drugs were more commonly prescribed in urban areas (e.g. Alprazolam: $p=0.008$). Overall, drugs are the most common type of treatment (11%/48%). Drugs were rated as more effective than complementary medicine and food additives (both $p>0.001$) and more effective than behaviour modification ($p=0.011$). Only management measures during noise events such as providing a place to hide and reducing visual stimuli were ascribed a similar effectiveness ($p=0.740$). Most veterinarians agreed that noise aversion reduces the quality of life of a dog (90%), tends to worsen over

time (79%), and should be treated (80%). Welfare-related aspects such as reduced quality of life or necessity of treatment were more often denied by male veterinarians ($p=0.005$).

Although discouraged, we found that Acetylpromazine is still one of the most common drugs prescribed. Awareness that noise aversion is a welfare problem in dogs seems to be quite high in veterinarians. To increase dog welfare, veterinarians should be trained to treat this common behaviour problem in dogs effectively.

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The emotional impact on veterinarians caused by the death of their patients

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Conflicts of interest: The authors declared none

Keywords: Patient deaths, causes, emotional impact on veterinarians, suicide

Veterinarians are at high risk of suicide, and death of a patient might be one of the professional risk factors. The aim of this study was to assess the emotional impact of patient death (natural and euthanasia) on veterinarians.

A 20-items online questionnaire was given to 586 Brazilian veterinarians: 78.5% were women, 41.3% between 31-40 years-old and 93.5% were small animal veterinarians.

Older veterinarians (graduated for more than 20 years) did not feel upset or frustrated when they had to euthanise or they could not save an animal, while new veterinarians (with less than 5 years from the degree) felt frustrated for many days after the death of both old and recent patients ($\chi^2=24.104$; $p=0.020$). Feline specialists and ophthalmologists reported more sensitivity to the patient death, while the orthopaedic surgeons and oncologists were less sensitive ($\chi^2=21.437$; $p=0.018$). Veterinarians who kept in contact with the owners after an animal's death, compared to those who did not keep any contact, felt significantly emotionally affected for up to 8 hours ($\chi^2=15.992$; $p=0.000$) and also after 24 hours

($\chi^2=23.328$; $p=0.000$). The vast majority of respondents (91.0%) were not trained during their degree course on how to overcome such grief. The ones who received some training were reported to be significantly less affected by grief ($\chi^2=12.739$; $p=0.005$).

These findings suggest that the death of a patient is a strong emotional issue for veterinarians, and a specific training during their training, which could be effective in preparing veterinarians to deal with bad news, is lacking.

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The use of 4A scale for veterinary guiding in canine behavioural disorders: first results of an on-going study

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Conflicts of interest: None of the authors above has a financial or personal relationship with other people or organizations that could inappropriately influence or bias the result of this research.

Keywords: 4A scale, dogs, behavioural disorders

INTRODUCTION

Behavioural veterinary medicine is witnessing a shift towards more quantifiable tools for assessment of behaviour [4]. Questionnaires have been already proposed to assess behaviour [2][6] or dog's emotional disorder [1][5]. But yet no veterinary dedicated simple tool for supporting diagnosis of canine behavioural disorders currently exist. The 4A scale introduced within the French behavioural school [3] aims to fill this gap. This short questionnaire aims to assess behavioural impairment according 4 dimensions: Aggression, Anxiety, Attachment and Auto-Control. We aim to examine the suitability of 4A for guiding diagnostic decisions.

METHODOLOGY

53 behavioural consultations of dogs during first-time visits to two veterinary clinics in Israel were recorded. During the sessions, the dogs underwent behavioural examination in a standardized symptoms-based procedure [3][5], supplemented by assessing the dog using the 4A scale. The participants consisted of 26 healthy dogs, 7 dogs diagnosed with Hypersensitivity/Hyperactivity (hyper), 12 with separation anxiety (sep) and 8 with deprivation syndrome (dep).

MAIN RESULTS

1. Median 4A scores:
healthy (n=26): 11.5 / pathological dogs (n=27): 25.
2. Median scores for each dimension:
Aggression: 2 (healthy), 2 (hyper), 2 (sep), 5 (dep)
Anxiety: 3 (healthy), 3 (hyper), 8 (sep), 12.5 (dep)
Attachment: 2 (healthy), 1 (hyper), 6.5 (sep), 4 (dep)
Auto-control: 3 (healthy), 10 (hyper), 6.5 (sep), 3 (dep)
3. Mann-Whitney U was used to establish independence between:
(1) anxiety from aggression, auto-control, and attachment,
(2) auto-control from anxiety and attachment (n=53, p< 0.01).

CONCLUSIONS

4A shows potential for supporting diagnostic decisions within the French approach; further validation is required.

REFERENCES

1. BEATA, C. ET AL. (2007) 'Effects of alpha-casozepine (Zylkene) versus selegiline hydrochloride (Selgian, Anipryl) on anxiety disorders in dogs', *Journal of Veterinary Behavior: Clinical Applications and Research*, 2(5), pp. 175–183.
2. HSU, Y. AND SERPELL, J. (2003). Development and validation of a questionnaire for measuring behavior and temperament traits in pet dogs. *Journal of the American Veterinary Medical Association*, 223(9), pp.1293-1300.
3. MÈGE, C. ET AL. (2003) *Pathologie comportementale du chien*. Edited by Elsevier Masson Editions. Paris, FR.: Masson-AFVAC.
4. OVERALL, K. L. (2014) 'The ethogram project', *Journal of Veterinary Behavior: Clinical Applications and Research*, 9(1), pp. 1–5. <https://doi.org/10.1016/j.jveb.2013.12.001>.
5. PAGEAT, P. (1998) *Pathologie du comportement du chien*. Maisons-Alfort: Editions du Point Veterinaire.
6. SALVIN, H. E. ET AL. (2011) 'The canine cognitive dysfunction rating scale (CCDR): A data-driven and ecologically relevant assessment tool', *The Veterinary Journal*, 188(3), pp. 331–336. doi: <https://doi.org/10.1016/j.tvjl.2010.05.014>.

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Effect of Felisept spray® on signs of travel anxiety in cats

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Quiko refunded Dr. Cannas for this research, which relates to a potential future product in development.

Keywords: cats, travel anxiety

Car transport can be stressful for cats. Most frequently reported signs are vocalisation, restlessness, panting, trembling, salivation and vomiting¹. These signs could be fear induced as a result of insufficient or bad experiences with car transport, but they could also result from motion sickness. However, the distinction between these two diagnoses is not very clear. Little research has been published in this area^{2,3}. This study aims to evaluate the effects of the Felisept spray® on the clinical signs of travel-related problems in cats.

Ten cats (6 males and 4 females) of different breeds, aged between 2 and 13 years, referred for problems when transported by car, were recruited. Owners were asked to fill in a questionnaire in order to determine cat behaviour during travel. Each cat was then filmed during two car journeys of 15 min. The first journey was a routine transportation (baseline trial), but in the second one Felisept® was sprayed into the pet carrier 10 minutes before travel (treatment trial). An additional questionnaire was used to investigate cat behaviour during the treatment trial.

Analysis of the questionnaires showed that vocalization, tail close to body and mydriasis decreased after the administration of Felisept spray® (Wilcoxon, $p < 0.05$), and panting and swallowing tended to decrease (Wilcoxon, $p = 0.66$). Video analysis showed that restlessness, crouched position and mydriasis decreased after the administration of Felisept

spray® (Wilcoxon, $p < 0.05$).

These results suggest that the use of Felisept® spray into a pet carrier 10 minutes before transport could decrease transport-related signs of stress in cats.

REFERENCES

1. DORING-SCHATZL, D., ERHARD, M. H. 2004. Undesirable behaviour of dogs in the car - prophylaxis and therapy. *Tierärztliche Praxis. Ausgabe K, Kleintiere/Heimtiere* 32, 3, 170-174
2. FRANK, D., GAUTHIER, A., BERGERON, R. 2006. Placebo-controlled double-blind clomipramine trial for the treatment of anxiety or fear in beagles during ground transport. *Canadian Veterinary Journal* 47, 11, 1102-1108
3. GANDIA ESTELLES, M., MILLS, D.S. 2006. Signs of travel-related problems in dogs and their response to treatment with dog-appeasing pheromone. *Veterinary Record* 159, 5, 143-148

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Characteristics of cats submitted to behavioral examination: a retrospective study

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Conflict of interest: The authors declare no conflict of interest.
Keywords: cat's problem behaviours, inappropriate elimination, aggression, compulsive disorder

Veterinary practices are increasingly consulted about behavioural problems in cats¹. This study aimed at characterizing similarities and differences in features underlying different cats behavioural problems.

207 cats attended the Behavior Clinic at the University of Milan between 1999-2017. Each cat underwent to a behaviour consultation focusing on all aspect of the cat's behaviour, management and health issues.

Of all of the cats involved, 51.2% had a diagnosis of inappropriate elimination, 15.9% of intraspecific and 14.9% of interspecific aggression, 8.5% of compulsive disorders and 9.5% other diagnoses (e.g. cognitive dysfunctions, inappropriate play, management problems). Cats with interspecific aggression were mostly to be males (76.6%), cats that had been adopted before 60 days of age (56.7%), or strays (53.3%) ($p \leq 0.05$). About 50% of cats with compulsive disorders were strays, whereas cats with inappropriate elimination were adopted mainly from another person (41%) ($p \leq 0.05$). No difference was found regarding the source of adoption in cats with intraspecific aggression. Owners of cats with interspecific aggression (36.7%) were significantly more inclined to surrender their cat to a cat

rescue centre, or to people who were owners of cats with other problem behaviours ($p \leq 0.05$).

Our work supports some previous findings^{2,3,4,5} and suggests new information. A referral population is not likely to be representative of the entire cat population, and in order to better understand patterns of behavioural problems, we need more complete population data including data from cats over their lifetime.

REFERENCES

1. HEATH, S. (2007). Behaviour problems and welfare. In: Rochlitz, I. (Ed.), *The Welfare of Cats*. Springer, Dordrecht, 91-118
2. HOUP, K.A. & BAMBERGER, M. (2006). Signalment factors, comorbidity, and trends in behavior diagnoses in cats: 736 cases (1991-2001). *JAVMA*, 229 (10), 1602-1606.
3. PALESTRINI, C., BERTESELLI, G., CANNAS, S., MICHELAZZI, M. & VOLONTÈ, L. (2008). Focus on feline behavioural disorders. Part I: Inappropriate elimination and marking. *Veterinaria*, 22 (4), 21-26
4. SOUZA-DANTAS, L.M., SOARES, G.M., D'ALMEIDA, J.M. & PAIXAO, R.L. (2009). Epidemiology of domestic cat behavioral and welfare issues: a survey of Brazilian referral animal hospitals in 2009. *Intern. J. Appl. Res. Vet. Med.*, 7 (3), 130-136
5. WASSINK-VAN DER SCHOT, A.A., DAY, C., MORTON, J.M., RAND, J. & PHILLIPS, C.J.C. (2016). Risk factors for behavior problems in cats presented to an Australian companion animal behavior clinic. *Journal of Veterinary Behavior*, 14, 34-40

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Partial rewarding during clicker training in dogs: effects on learning speed and affective state

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Funding: Royal Canin
Conflict of interest: The authors declare none
Keywords: Clicker training, affective state, dogs, learning speed

Clicker training is a widely used technique to teach animals novel behaviours¹. As it is a reward-based training method, it is generally seen as being animal welfare positive. However, trainers largely vary in their use of clicker and some suggest that training efficacy can be improved if food is not delivered after every click. In contrast, it has been shown that rodents are negatively affected when their expectation of receiving a reward is frustrated², which questions the use of such partial rewarding (PR). This study aimed to investigate the effects of PR during clicker training on training efficacy and dogs' affective state.

We trained two groups of dogs (tot N=31) to perform a novel behaviour using a clicker-assisted shaping procedure. One group was rewarded after each click (Continuous Rewarding: CR) while dogs in the second group received a reward randomly only after 60% of the clicks (PR). Moreover, after the last training session, we tested dogs in a test measuring the valence (positive or negative) of an animal's affective state.

Dogs did not differ in their rates of acquisition of the novel behaviour (Mann Whitney U test: $W=93$, $p=0.22$) and the PR group showed a more negative bias when judging an ambiguous stimulus in the cognitive bias test than dogs in the CR group (LMM: $\chi^2=13.27$, $df=1$, $p<0.001$). These results show that using a partial rewarding schedule does not improve train-

ing efficacy and it has a negative effect on the affective state of dogs, raising animal welfare concerns.

REFERENCES

1. FENG, L.C., HOWELL, T.J. & BENNETT, P.C., 2018. Practices and perceptions of clicker use in dog training: A survey-based investigation of dog owners and industry professionals. *Journal of Veterinary Behavior: Clinical Applications and Research*, 23, pp.1–9. Available at: <https://doi.org/10.1016/j.jveb.2017.10.002>
2. BUROKAS, A. ET AL., 2012. Operant model of frustrated expected reward in mice. *Addiction Biology*, 17(4), pp.770–782. Available at: <http://doi.wiley.com/10.1111/j.1369-1600.2011.00423.x>

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Psychoactive drugs – rational use to change dog and cat's stress behaviour during hospitalization

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Conflict of interest: The authors declared none

Keywords: Psychoactive drugs, licensing, stress dogs and cats, hospitalisation

When dogs and cats are hospitalized their welfare is usually reduced¹ and for anxious/fearful animals, environmental enrichment may not be sufficient to overcome their distress^{2,3}. Psychogenic distress may delay the animals' full recovery⁴, besides being a source of distress to others⁵. Psychoactive drugs are important pharmacological tools that help veterinarians to solve animal behaviour problems, improving their welfare⁶. Nevertheless, their use as a therapeutic aid in stressed hospitalized animals is uncommon. The aim of this review is to systematize information regarding psychoactive drugs that have the potential to be used in hospitalization to reduce dogs and cats short term distress. Recently, it was described the beneficial anxiolytic effect of trazodone in hospitalized dogs⁷ and cats^{8,9}, a useful alternative to the use, for example, of acetylpromazine, that has sedative and analgesic properties but little anxiolytic effect². According to the literature, several other drugs like benzodiazepines, α_2 -agonists, 5-HT_{2A} antagonists and gabapentin have anxiolytic properties^{2,6,10,11} in dogs and cats, but their use should also consider possible interactions with other drugs and the animal's clinical condition - pain must always be relieved as it is a fundamental source of distress. The psychoactive drugs bibliography is not consistent neither in dose nor in administration frequency, and most of their use is off-label. Further studies are needed for veterinarians to be able to use the full range of these therapeutic options so that their animal patients can be hospitalized in a stress-free environment.

REFERENCES

1. YIN, S. (2009) Low Stress Handling, Restraint and Behavior Modification of Dogs and Cats: Techniques for Developing Patients Who Love Their Visits. CattleDog Publishing.
2. OVERALL, K. (2013) Manual of Clinical Behavioral Medicine for Dogs and Cats - E-Book. Elsevier Health Sciences.
3. BALLANTYNE, K. C. (2018) Separation, Confinement, or Noises: What Is Scaring That Dog? Vet Clin North Am Small Anim Pract.
4. HEKMAN, J., KARAS, A. AND SHARP, C. (2014) Psychogenic Stress in Hospitalized Dogs: Cross Species Comparisons, Implications for Health Care, and the Challenges of Evaluation. *Animals* 4 (2), 331.
5. SALES, G., HUBRECHT, R., PEYVANDI, A., MILLIGAN, S. AND SHIELD, B. (1997) Noise in dog kennelling: is barking a welfare problem for dogs? *Applied Animal Behaviour Science* 52 (3-4), 321-329.
6. CROWELL-DAVIS, S. L. AND MURRAY, T. (2008) *Veterinary Psychopharmacology*. Wiley.
7. GILBERT-GREGORY, S. E., STULL, J. W., RICE, M. R. AND HERRON, M. E. (2016) Effects of trazodone on behavioral signs of stress in hospitalized dogs. *Journal of the American Veterinary Medical Association* 249 (11), 1281-1291.
8. ORLANDO, J. M., CASE, B. C., THOMSON, A. E., SHERMAN, B. L. AND GRIFFITH, E. (2016) Use of oral trazodone for sedation in cats: a pilot study. *JOURNAL OF FELINE MEDICINE AND SURGERY* 18 (6), 476-482.
9. STEVENS, B. J., FRANTZ, E. M., ORLANDO, J. M., ET AL. (2016) Efficacy of a single dose of trazodone hydrochloride given to cats prior to veterinary visits to reduce signs of transport- and examination-related anxiety. *Journal of the American Veterinary Medical Association* 249 (2), 202-207.
10. LANDSBERG, G. M., HUNTHAUSEN, W. L. AND ACKERMAN, L. J. (2012) *Behavior Problems of the Dog and Cat3: Behavior Problems of the Dog and Cat*. Saunders.
11. HORWITZ, D. F. (2017) *Blackwell's Five-Minute Veterinary Consult Clinical Companion: Canine and Feline Behavior*. Wiley.

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Evaluation of empathy levels towards animals using a validated scale by Paul, (2000) within a population sample in Mexico City

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Conflict of interest: The authors declare no conflict of interest.

Keywords: empathy, animals, Mexico, women

Empathy is the ability to understand and share the feelings of others, be it people or animals¹. The purpose of this study is to understand the levels of empathy towards animals within a population sample in Mexico City using a scale previously created and validated². Likewise, an assessment was carried out in order to understand the relationship between demographic factors – such as gender, age, educational level, home structure and pet ownership – and the reported levels of animal empathy. The following predictions were made: 1) women will show higher empathy levels; 2) age will have a positive effect over empathy levels; 3) participants that have pets and possess a higher educational level will report higher empathy levels, and 4) participants that live with minors will show higher empathy levels than those who don't.

A Google Forms questionnaire was sent out, to which, 957 people responded. A statistical analysis based on a logistical model was carried out in order to predict the result of the categorical variable 'empathy level' as it relates to the predictor variables, these being: gender, minors at home, and pet ownership the most significant ones ($p < 0.05$). Women and pet owners displayed greater empathy levels, unlike participants with a higher level of education or those living with minors.

This pilot study shows that people, in general, care about animals and display empathy feelings for them. The results could help lay the foundations for future research in empathy towards animals, as well as the characterization of the Mexican population.

REFERENCES

1. MICHALEC, L. (2011) Learning to cure, but learning to care? *Adv Health Sci Educ*, 16(1), pp. 109-130.
2. PAUL, E. (2000). Empathy with animals and with humans: Are they linked? *Anthrozoös* 13, pp. 194–202.

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Oakland Veterinary Referral Services

A survey investigating the observed frequencies of conflict signs between cats in multiple cat households

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Conflicts of interest: This study was funded by Ceva Animal Health who employs Alexandra Beck. Theresa L. DePorter provides regular consulting services for Ceva Animal Health and Ashley L. Elzerman is currently undertaking a residency in veterinary behaviour sponsored by Ceva Animal Health.

Keywords: Cats, households, conflict

An online survey of feline owners was undertaken to ascertain the observed frequencies of affiliative and conflict signs between housemate cats.

Through social media, households in the United States with 1-4 indoor or indoor/outdoor cats were targeted. Owners were asked to select the frequency of each of seven conflict signs noted between any of the cats in their household. The frequency categories included: several times a day, daily, weekly, monthly or less, and never. For data analysis the categories of several times a day and daily were combined.

A total of 3,920 surveys were completed including 1,428 single cat households and 2492 multiple cat households. The percentage of multiple cat households reporting a daily or more frequent occurrence of these conflict signs, listed in order of decreasing percentage, were: stare (44.9%), chase (44.4%), stalk (35.0%), flee (30.1%), twitch tail (25.2%), hiss (18.0%), and wail or scream (5.3%). The percentage of owners reporting these signs of conflict as occurring at least daily increased with the number of cats in the household. While 12.3% have never noted any of these signs of conflict between their cats, the majority, 73.3%, noted these signs of conflict from

the beginning of introducing a cat into the house.

This study documents the frequency of conflict signs in multiple cat households as well as some of the factors affecting the frequency. Since the majority of these signs began at introduction, education about subtle signs of conflict should be an area of focus to improve feline welfare.

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Enhancing dogs' welfare during a veterinary consultation: impact of environmental factors and positive interactions before the consultation

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Conflict of interest: The authors declared none.

Keywords: dog welfare, veterinary consulting rooms, mitigation

While dogs' well-being is becoming more and more important for owners and veterinarians, going to a veterinary practice is a stressful situation¹ for more than 75% of dogs. Veterinarians can find help in guides for good practices², however, some scientific information is still needed to better inform them.

The aim of this study was twofold: 1) identify environmental factors enhancing dogs' stress before and during examination, and 2) test whether positive interactions in the waiting room could help reducing dogs' stress.

The first study was performed on 51 dogs coming for a preventive consultation. They were filmed and lip licking, struggle, paw lifting, yawning, fear posture were recorded. Stress signals were significantly higher when dogs waited longer than 6 minutes ($n=47$, $p=0.019$, $W=159$), when the room contained more than 12 persons ($n=41$, $p=0.004$, $W=215$), and when only 2 dogs were left in the room ($n=40$, $p=0.02$, $W=73$). Sound intensity also increased stress behaviours (correlation: $r=0.37$, $p=0.01$).

The second study was performed on 40 dogs. Each dog was observed twice during a standardized consultation (for protocol see 3). Prior to one of these two consultations, treats were given to the dog. Giving treats to dogs in the waiting room significantly reduced the number of stress-induced behaviours: lip licking was reduced ($W = 555$, $p=0.01$, $n=40$), and exploration was increased ($W=500$, $p=0.03$, $n=40$). Giving treats prior to the consultation also helped dogs to better habituate to the consultation.

We recommend adapting the environment in the waiting room to reduce dogs' stress reactions during clinical examinations.

REFERENCES

1. DORING, D., ROSCHER, A., SCHEIPL, F., KUCHENHOFF, H., ERHARD, M.H. (2009). Fear-related behaviour of dogs in veterinary practice. *The Veterinary Journal* 182, 38–43.
2. MILLS, D., KARAGIANNIS, C., ZULCH, H. (2014). Stress - Its Effects on Health and Behavior: A Guide for Practitioners. *Veterinary Clinics of North America: Small Animal Practice*. 44, 525-541.
3. CSOLTOVA, E., MARTINEAU, M., BOISSY, A., GILBERT, C., 2017. Behavioral and physiological reactions in dogs to a veterinary examination: Owner-dog interactions improve canine well-being. *Physiology & Behavior* 177, 270–281.

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“Edda” One Small Step a Day – Consultation and training against aggression of unknown origin

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Conflicts of interest: The author certifies that there is no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

Keywords: aggression of unknown origin, dog boarding school, dog training, Greek herd protection dog, animal welfare

This case report puts forward an interesting alternative to the common behavioural consultations. A residential dog boarding school can be helpful for all participants. It causes less stress for the dogs and owners, promoting good results through optimized monitoring and training.

INTRODUCTION

A 12 month old female dog, originating from a Greek animal welfare centre, was returned to the organization. Reason: Aggression towards the owner and another dog (sister). Acute problem: Had not urinated or passed faeces for four days. She shows aggression against all persons and objects. She can't be easily restrained, and has already bitten the keeper.

ASSIGNMENT

Lead Edda from dog's room and give her the possibility to relieve herself on the grass. General assessment of Edda's aggression level and treatability with respect to renewed adoption. An exact evaluation of all possible causes of the case via monitoring, Prognosis and start of training in the practice-owned dog boarding school. Veterinary examination

HISTORY

Day 1: I entered the dog's room – I used passive behavioural patterns – Edda responded with spontaneous urination. Edda barked, growled then hinted at charging/attacking me, she did not calm down. As the dog's room needed to be cleaned, the only option was to lasso her (throwing the leash over her). Once captured she instantly approached and showed submissive behaviour (active and passive). We left the room and walked on the grass. Back in the room, I left 2 leashes on her. Homework to the employees: only one person is to handle Edda. No talking by the kennel cage, no approaching from the front. Pick up leash slowly without talking, looking or touching Edda. Day 2: Edda had destroyed the leashes and so she could not be lead out of the room again. A decision was made to place her at the dog boarding school of Stephanie Grath for 14 days.

EVALUATION AND TRAINING

The evaluation is based on a self-developed concept using assessment criteria for guide dogs and assessment criteria of aggressive dogs. The training is a mix between desensitization and flooding. The aim is to optimize the behaviour and rehome the dog.

CONCLUSIONS

Edda shows inhibited defensive attacks when she feels threatened. The triggers are: Collar contact, confrontations in /near the kennel, another dog next door, or defending resources. When encountering other dogs she shows anxious / neutral signals. Sometimes she plays with dogs she knows.

ASSUMPTIONS

Breed related issues (Phenotype-growing herd protection dog mix), multiple deprivation, aggression is intensified by people and environment, chronic pain after the neutering surgery.

GOALS

Short Term Goals- cure the clinical problem, avoid triggers and stress, optimize human reactions, increase tolerance in various situations. Long term Goals: Build trust in a person, introduce and maintain rituals for critical situations, training to accept dogs, general obedience, accept being touched.

MANAGEMENT AND TRAINING

The first couple of days we worked on Edda's bond and orientation to a person. She was hand fed. Additionally we provided frequent body contact like petting or lying close to a person. Edda got on well with some dogs so those dogs participated to support her in various situations. As Edda had little contact outside her owner's house, occasional we used the flooding technique.

MANAGEMENT: Indoor kennel, ensure secure fit of collar and harness, securing through multiple leashes and additional rope on walks. AVOID STRATEGY: never let go of leash when putting dog into box or kennel always hook leash into box clasp.

OPTIMIZE COMMUNICATION/ HUMAN REACTION : avoid gaze, lateral approach, hand feeding, marker word as secondary amplifier (ref. Clicker), give time to explore new situations, correct interpreting of body language, optimized timing, reward frequency and amplifiers.

CONTROL: Obedience after reduction the anxiety/ panic reactions towards surroundings and trainer. Trained tasks: Walking on leash (no squeezing between the legs, stay on left side only). "Edda" as a signal to attention, possibly as return signal; sit before release from kennel, sit next to human, no jumping up.

TOLERATION OF FRUSTRATION/ IMPULSE CONTROL: desensitize the training area and surroundings through long stays on the premises.

MEDICATION: None except the drugs for the Pain after the Neutering surgery

PROGNOSIS

In unfamiliar situations, Edda reacts anxious and panicky. When handled by people whom she trusts, she is now showing signs of increasing self-confidence. The training has not been completed and will perhaps have to be continued throughout her lifetime. The training bases on ritualized conflict solutions, orientation and bonding to (reference) people. A training plan can be created in cooperation with a specialized dog trainer.

Summary of the conflict solving strategies shown before and after the training on the basis of the "4 F's"

BEFORE TRAINING: Edda has a tendency towards "Flight" (subtle to strong flight behaviour). When "flight" is not possible, she switches into a brief "Freeze" before going into "Fight" mode. She starts with threatening gestures (Fixation and minimal pulling up of the lips). If this threatening behaviour is acknowledged she returns to "freeze". When ignored, she begins barking and biting into the air from a distance.

AFTER 14 DAYS DOG BOARDING SCHOOL: After the beginning "flight" she is showing longer phases of "freeze" and turns to her reference person (eye contact). She is becoming confident with her current reference person. She accepts touching and is managing conflicts of all kinds. With strangers she is reserved but increasingly interested in them.

AS OF JUNE 2018

Edda can handle selected dogs, neutral persons she meets without issues, but with "Conspicuous" strangers she reacts reservedly. She accepts without problem even painful medical treatments (aspiration of abdomen) with her reference person in the room. We have a potential future owner, who works a lot with Edda.

LITERATURE AVAILABLE FROM THE AUTHOR:

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The first assessment of dog bite prevention programme for pre-school children in Turkey

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Conflicts of interest: The authors declared there were none
Keywords: child-dog interactions, child safety, dogs, dog bites

Dog bites are mostly caused by miscommunication between humans and dogs. Although physical and emotional health of humans, in particular children may seriously be affected by dog bites, they mostly occur due to humans' lack of ability to read behavioural expressions and related emotions in dogs. Several studies have shown that dog safety programmes increase the ability of children to interpret dog behaviour.(1) Those programmes have a crucial importance to reduce the incidence of dog bites in particular in countries facing rabies and free-ranging dog problems, such as Turkey. This study is the first effort to evaluate children's knowledge on dog behaviour and further to assess effectiveness of dog safety programmes in a country having free-ranging dog population.

An introductory education programme was conducted in three different pre-schools in Bodrum/Turkey. In total, 117 students aged between 3 to 6 years old were included in this study. The education programme consisted of an oral presentation using Powerpoint slides including dog pictures with different emotional states and in different situations. A short drama

“be a tree” was also performed with children in the classroom. Total duration of education was about 40 minutes. 2 different questionnaires with pictures of dogs in different contexts were administered to children before the programme, immediately after the programme and 1 week after the programme.

Before performing the statistical analysis, data were examined for normality with a parametric test assumption. Descriptive statistics for each questionnaire were calculated and presented. The differences in each questionnaire for percentage of children’s success was evaluated using a Friedman test. If a significant difference was found then significant terms were compared by Wilcoxon signed rank test.

For all comparisons, differences were considered with a minimum of $p < 0.05$ significance. All statistical analyses were performed by using SPSS@22 package programme for Windows. Most of the students marked the inappropriate interactions with the dog before the education. In the first questionnaire, there was a statistically significant improvement between pre-education, post-education and one week after the education in terms of percentage of children’s success ($p < 0.05$). The success rate before the education was measured as 55%, and the success rates increased to 76% and further to 78% one week after education. Before the education programme, hugging/embracing dogs and patting top of dog’s head were considered as correct behaviours (respectively, 63.8% and 68%) by most of the children. There was a significant decrease in the percentage of incorrect responses to questions in these contexts during the post-education (34.3% and 17.9%, respectively) and one week later (29.3% and 23.7%, respectively) assessments.

In the second questionnaire, there were significant differences between pre-education, post-education and one week later assessment in terms of percentages of children’s success ($p < 0.05$). The success rate was 76% in the pre-education assessment, while it was 83% immediately after the education and 87% one week after the education ($p < 0.05$).

The results of this study have shown that the introductory dog safety programme has a significant effect on improving children’s knowledge of correct interactions with dogs. This results support the idea that these kinds of programmes should be enrolled in pre-school curriculum in countries where children constantly interact daily with urban free ranging dogs.

REFERENCES

1. LAKESTANI N, & DONALDSON ML. (2015) Dog Bite Prevention: Effect of a Short Educational Intervention for Preschool Children. PLoS ONE 10(8) (2015), e0134319. <https://doi.org/10.1371/journal.pone.0134319>

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Obsessive-compulsive disorder in dogs and cats: A retrospective study of 60 cases (2010-2017)

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Keywords: Obsessive-compulsive disorder, dog, cat, tail chasing, self-mutilation

INTRODUCTION

Obsessive-compulsive disorders (OCD) in humans and in animals are characterized by repetitive, ritualistic behaviours, which interfere with normal activities and functioning (1). The main OCD observed in dogs include chewing, circling, fabric sucking, fence running, flank sucking, fly biting, hair or air biting, pacing or spinning, pica, self-mutilation, staring, tail chasing and vocalizing. In cats excessive grooming, self-mutilation, tail chasing, wool or fabric sucking or chewing are the most commonly observed OCD (2,3). Compulsive behaviours are considered to be a reflection of stress, frustration and conflict (3). The aim of this study was to retrospectively investigate the clinical features of OCD in dogs and cats.

METHODOLOGY

43 dogs and 17 cats observed with OCD. Behavioural diagnosis was made for each dog and cat on the basis of behavioural history, clinical signs, and results of laboratory measurements. Other possible medical

problems were excluded on the basis of clinical and haematological examination and urinalysis. From the medical records, patients were classified by gender and neutered status, breed, category of OCD, age of onset, number of humans in the household.

MAIN RESULTS

The most commonly affected dog breeds with OCD were German Shepherds, Anatolian Shepherds and Dobermans with OCD. Our results support other studies (4,5) that herding dogs (German Shepherds and Anatolian Shepherds) more commonly have OCD. Cats with OCD were 8 mixed breeds, 5 Siamese and 1 cat each of British Shorthair, Scottish fold, Angora and Persian. The mean±SD age of onset was 25.6±22.1 months in dogs and 17.4±13.2 months in cats. 9 dogs (20.93%) lived in a household with just one human, 9 cats (52.94%) lived in single human households. The OCD rate in dogs was highest in households with three or more people in our study. In our study we found that the most commonly observed OCD in dogs was associated with locomotion (spinning and chasing), and in cats it involved grooming and pica. Females were also very significantly outnumbered by male dogs (34 male and 9 females 3: i.e. ratio 7:1) and the numbers of cats were 7 males and 10 females.

CONCLUSION

Clinicians should be particularly aware that OCDs may occur in several clinical forms and that young males and certain breeds are particularly prone to developing OCD. Findings of this study may aid in the recognition and diagnosis of dogs and cats with OCD.

REFERENCES

1. OVERALL K.L., DUNHAM A.E.: Clinical features and outcome in dogs and cats with obsessive-compulsive disorder: 126 cases (1989-2000). *J. Am. Vet. Med. Assoc.* (2002), 221, 1445-1452.
2. HEWSON C.J., LUESCHER U.A., BALL, R.O.: (1999) The use of chance corrected agreement to diagnose canine compulsive disorder: an approach to behavioral diagnosis in the absence of a 'gold standard'. *Can. J Vet.*, 63, 201-206.
3. LUESCHER U.A., MCKEOWN D.B., HALIP, J.: (1991) Sterotypic or obsessive-compulsive disorders in dogs and cats. *Vet. Clin. North Am. Small Anim. Pract.*, 21(2), 401-413.
4. YALCIN E., ILCOL Y., BATMAZ H.: Serum lipid concentrations in dogs with tail chasing (2009). *J Small Anim. Pract.* 2009, 50 (3), 133-135.
5. YALCIN E.: Comparison of clomipramine and fluoxetine treatment of dogs with tail chasing (2009). *J Small Anim. Pract.* 2009, 50 (3), 133-135.

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Assessing Stress in Laboratory Dogs to Car Rides and Rehousing

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Stress in laboratory housed dogs can negatively impact an animal's health and welfare as well as the results of laboratory studies^{1, 2, 3, 4}. When transporting animals to an unfamiliar research facility for off-site procedures such as magnetic resonance imaging (MRI), both the transportation to, and acclimation to the novel environment may be stressful. In a study of over 900 client owned dogs, approximately ¼ of the dogs responded negatively to travel⁵. The objective of this study was to assess the stress associated with transport and acclimation to an unfamiliar housing environment. All study procedures were approved by the Vivocore facility Animal Care and Use Committee.

Stress was assessed in 10 laboratory Beagle dogs that were transported together in individual carriers on a 2-hour van journey to a research facility and then housed in the new environment for 7 days. On a separate occasion, each dog was also transported either singly or in pairs for a 2-hour van journey and returned to the home facility. Serum samples were collected prior to transport, upon arrival at the research or home facility, and at 1, 24, 48, 96 and 168 hours after arrival. On the single and paired journeys, an additional sample was collected after ten minutes of transport and video recordings were made which were assessed for signs of anxiety at 0-2 minutes, 30-32 minutes, 90-92 minutes and 118-120 minutes. All measures were evaluated statistically using a repeated-measures analysis of variance (ANOVA) and Fisher LSD post-hoc as appropriate. Imme-

diately following the 2-hour ride, cortisol levels were significantly lower when the dogs were transported as a group ($F(12,108)=7.77$; $p<0.0001$) compared to single ($p<0.01$) and paired ($p=0.02$) transport. Post hoc analysis also revealed cortisol levels were also significantly lower during paired transport compared to single transport at both 10 minutes into the car ride ($p<0.05$) and immediately following the car ride ($p<0.01$). Cortisol levels were significantly higher from 24 to 168 hours after transport when subjects were housed in the unfamiliar environment compared to when they were returned to their home environment ($F(12,108)=7.77$; $p<0.0001$). Post hoc analysis revealed that the differences were significant ($p<0.05$) at all time points.

Mean global anxiety scores during both paired and singly transport significantly declined over the course of the journey ($F(2,18)=10.62$; $p<0.001$) as measured at 0-2, 30-32, and 90-92 minutes. However, anxiety was also lower when subjects were transported in pairs, although the difference was not significant. The effects of either single or paired travel on cortisol followed a similar pattern, Cortisol was significantly increased ($F(3,27)=63.91$; $p<0.00001$) after 10 minutes of travel and immediately post travel ($p<0.0001$) compared to pre-travel. Compared to 10 minutes of travel cortisol was significantly reduced immediately following travel ($p<0.001$) and at one-hour following travel $p<0.001$, at which point cortisol was not significantly different from pre-travel.

The study demonstrated that a 7-day acclimation period in a non-familiar facility caused greater stress in dogs compared to return to their home facility. A significant decline in anxiety was seen over the 2-hour car ride, with cortisol returning to baseline within 1 hour of return to the home facility. This suggests that return to a home facility after imaging or other procedures should be conducted to reduce overall stress in dogs. Stress was lowest when animals travelled as a group, however, during group transport, dogs were transported in smaller plastic crates with opaque sides (Vari-Kennels) which may have reduced anxiety. These results also demonstrate that 10 minutes of travel could serve as a standardized model of fear and anxiety for the evaluation of therapeutic effects of potential anxiolytic drugs or natural supplements.

REFERENCES

1. BRAGG RF, BENNETT JS, CUMMINGS A ET AL. 2015. Evaluations of the effects of hospital stress on physiologic variables in dogs. *J Am Vet Med Assoc* 246: 212-15
2. QUIMBY JM, SMITH ML, LUNN KF, 2011. Evaluation of the effects of hospital visit stress on physiologic parameters in the cat. *J Fel Med Surg* 13: 733-737
3. NIBBLETT BM, KETZIS JK, GRIGG EK, 2015. Comparison of stress exhibited by cats examined in a clinic versus a home setting. *Appl Anim Behav Sci* 173: 68-75
4. HEKMAN J, KARAS AZ, SHARP CR, 2014. Psychogenic stress in hospitalized dogs; cross species comparisons, implications for health care, and the challenges of evaluation. *Animals*. 4: 331-34
5. MARITI C, RICCI E, MENGOLI M ET AL. 2012. Survey of travel related problems in dogs. *Veterinary Record*, 170: 542.

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Risk factors related to canine aggression towards family members in Argentina

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Conflict of interest: none was declared

Keywords: canine, aggression, family members, risk factors

Canine aggression towards family members can have dangerous consequences for people and may impair the welfare of dogs. The aim of this study was to determine risk factors related to canine aggression towards family members in Argentina. To the best of the author's knowledge, there are no published data about risk factors for this problem in Argentina.

An online questionnaire was completed by dog's owners between December 2015 and March 2016. A total of 355 questionnaires were suitable for analysis. A logistic regression model was applied to detect possible causal factors. Dogs living with more than one person had a higher risk of being aggressive towards family members ($P=0.003$). Male dogs had a higher risk of having shown signs of aggression than females ($P=0.004$). Dogs were divided into 3 groups according to their age and it was observed that dogs between 1 and 4 years had a lower risk of being aggressive ($P=0.001$) than dogs more than 4 years old. Not having access to a garden was also found to be a risk factor ($P=0.03$). Dogs that were fed from the table in a random way had a higher risk of being aggressive than dogs that were never fed from the table ($P=0.04$). Finally, dogs allowed to get on the sofa ($P=0.001$) had a higher risk of being aggressive towards family members than dogs not allowed to do that.

These findings provide insight into some of the risk factors related to canine aggression toward family members in Argentina and may help to develop more effective preventive and treatment strategies.

REFERENCES

1. FATJO, J., AMAT, M., MARIOTTI, V.M., RUIZ DE LA TORRE, J.L., MANTECA, X. (2007). Analysis of 1040 cases of canine aggression in a referral practice in Spain. *Journal of Veterinary Behaviour*, 2, pp.158-165.
2. LE BRECH, S., AMAT, M., CAMPS, T., TEMPLE, D., MANTECA, X. (2016) Canine aggression toward family members in Spain: clinical presentations and related factors. *Journal of Veterinary Behavior*, 12, pp. 36-41.
3. LEUSCHER, A.U., REISNER, I.R. (2008). Canine aggression toward familiar people: a new look at an old problem. *Veterinary Clinics of North America: Small Animal Practice*, 38, pp.1107-1130.

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A Tale of Two Tails: A Comparison of Two Presentations of Tail Chasing

J. Ley

Conflicts of interest: none was declared

Keywords: Case studies, tail chasing

CASE 1

A 4 year old male neutered Pomeranian presented for sudden onset self-injurious tail chasing resulting in amputation of his tail 11 days after the onset of signs. His distress continued after the amputation. The presumptive diagnosis was neuropathic pain. An MRI and neurology referral were declined. Treatment included Valium, NSAIDs, Gabapentin and distraction from tail chasing. Improvement occurred quickly. Valium and NSAIDs were stopped and Gabapentin decreased. It was increased when the dog showed interest in his tail 3 weeks after reduction.

CASE 2

A 1.5 year old male neutered Jack Russell terrier had an 11 month history of playful tail chasing (spinning) when outside and aggressive foot chasing when frustrated. A diagnosis of compulsive disorder was made and treatment started with Medication (Fluoxetine and Gabapentin), Behaviour modification and Environmental Management. After 8 weeks his spinning reduced but the foot chasing when frustrated persisted. Gabapentin was stopped and the Fluoxetine increased. The behaviour modification was re-iterated for the owners: they were encouraged to think preventively.

Compulsive disorders indicate a problem with executive functions in the brain (1) and often respond to SSRIs (2,3), behaviour modification and

environmental management. Neuropathic pain is pain caused by injury or inflammation in the nerves, (4) and has several causes, but is difficult to confirm and responds to a variety of treatments. While each dog responded to the medications and treatment plans, Case 1 achieved full resolution of his signs while Case 2, as is typical of compulsive disorder, is on-going. Careful assessment is needed to unravel tail chasing.

REFERENCES

1. GARNER, J.P. (2006). Perseveration and Stereotypy- Systems-Level Insights from Clinical Psychology. In G. J. Mason & J. Rushen (Eds.), *Stereotypic Animal Behaviour- Fundamentals and Applications to Welfare* (2nd ed.). Wallingford: CABI.
2. DAVIDSON, J. R. T., CONNOR, K. M., & ZHANG, W. (2009). Treatment of Anxiety Disorder. In A. F. Schatzberg & C. B. Nemeroff (Eds.), *The American Psychiatric Publishing Textbook of Psychopharmacology* (4th ed., pp. 1171-1199). Washington: American Psychiatric Publishing Inc.
3. MILLS, D. S., & LUESCHER, A. U. (2006). Veterinary and Pharmacological Approaches to Abnormal Repetitive Behaviour. In G. J. Mason & J. Rushen (Eds.), *Stereotypic Animal Behaviour* (2nd ed.). Wallingford: CABI.
4. KROENKE, K., E.E. KREBS, AND M.J. BAIR, Treatment of Chronic Pain Syndromes, in *The American Psychiatric Publishing textbook of Psychopharmacology*, A.F. Schatzberg and C.B. Nemeroff, Editors. 2009, American Psychiatric Inc: Washington. p. 1441-1474.

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Coprophagy in dogs: related factors

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Conflicts of interest: none was declared

Keywords: Dogs, coprophagia, sex predisposition,

Coprophagy is a common behaviour in dogs (1). There is little scientific evidence about the causes of this behaviour (1). It is considered the most common form of pica in dogs (2,3). The aim of this study is to find possible associated factors to coprophagy in dogs. A total of 821 owners participated in the online survey.

A total of 67% (n=547) dogs showed signs of general coprophagy: 24% (n=131) of these dogs ate their own faeces, 17% (n=95) ingested faeces from other dogs and 65% (n=356) ate faeces from other animals. Logistic regression models were applied to detect possible causal factors of general coprophagy and coprophagy directed to own faeces. Females showed general coprophagy more frequently than males (74% vs 60%; $p < 0.0001$). In addition, it was more common in dogs adopted from shelters (83%; $p < 0.0001$) than those bought from shops (59%; $p = 0.02$) or private breeders (64%; $p = 0.0005$). Coprophagy of own faeces is more common in intact animals (23%) than neutered (12%) ($p = 0.02$) and in dogs coming from shops (41%) than all the others ($p < 0.0001$). This coprophagy was more likely to manifest when dogs were puppies (42%; $p < 0.0001$) than later in life.

Several factors were associated to coprophagy in dogs and may be of help to treat this behavioural problem.

REFERENCES

1. BOZE, B., 2010: Correlates of coprophagy in the domestic dog (*canis familiaris*) as assessed by owner reports. *Journal of Applied Companion Animal Behavior*, 4 (1): 28-37.
2. MANTECA, X., 2009: *Etología Veterinaria*. Multimédica Ediciones Veterinarias. 3ª Edición.
3. AMAT, M., CAMPS, T., LE BRECH, S., TEJEDOR, S., 2016: *Manual Práctico De Etología Clínica En El Perro*. Multimédica Ediciones Veterinarias.

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Comfort foods in chronically stressed dogs: effects on ghrelin and cortisol levels

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Conflicts of interest: The authors declared they have none.

Keywords: Dogs, separation anxiety, conflict-related aggression, stress, eating disorders

Emotional (or stress-induced) eating refers to a change in the eating behaviour as a way of coping with negative emotional states or stress¹. It especially involves the intake of comfort foods, which are those rich in energy, fat or sugar content². We have recently reported that a large proportion of owners perceive that their dogs show emotional eating³. The aim of this work was to study the effect of administering high energy palatable food on cortisol and ghrelin levels in dogs showing chronic stress related to separation anxiety (SA) and to social conflict-related aggression towards the family members (SCA). Baseline and post-prandial serum concentrations were analysed in the stressed group (n=16), and in a group of non-stressed control dogs (n=16). Cortisol levels (%) after eating in SCA dogs was raised, differing significantly from the SA and the control groups, in which cortisol decreased. However, unlike cortisol, ghrelin levels decreased significantly in SA dogs after eating. These findings suggest that the effect of administering palatable food on the stress response may be different in SCA and SA. Thus, a parallel meal-induced decrease in both hormones occurred in the SA group but not in the SCA group, pointing towards a failure to suppress ghrelin (and cortisol) after intake in the latter. The possible alleviatory effect of food consumption, particularly of comfort

food, after the owner is back home in SA dogs, as well as the changes in dogs' eating behaviour in response to emotional states or stress ("emotional eating") will require further studies.

REFERENCES

1. MCMILLAN, F. (2013) Stress-induced and emotional eating in animals: A review of the experimental evidence and implications for companion animal obesity. *Journal of Veterinary Behavior: Clinical Applications and Research*, 8 (5), 376-385.
2. SOMINSKY, L. & SPENCER, S. (2014) Eating behavior and stress: a pathway to obesity. *Frontiers in Psychology*, 5, 434.
3. LUÑO, I., PALACIO, J., GARCÍA-BELENQUER, S., GONZÁLEZ-MARTÍNEZ, Á. & ROSADO, B. (IN PRESS). Emotional eating in companion dogs: owners' perception and relation with feeding habits, eating behavior and emotional state. *Journal of Veterinary Behavior: Clinical Applications and Research*, in press.

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Effects of petting before a brief separation from the owner on dog behaviour and physiology: a pilot study

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Conflicts of interest: The authors declared they had none.

Keywords: dog, petting, separation anxiety,

Human physical contact is known to be effective in decreasing dogs' levels of stress, assessed through endocrine, physiological and behavioural parameters. Gentle touching has been found to be beneficial for dogs while experiencing or after having experienced a stressful event. The aim of the current study was to assess if dog behaviour and physiology during a brief separation from the owner were modified by being petted before the owner's departure.

Ten dogs, not affected by separation-related problems, were tested twice when separated for three minutes from the owner: before separation: dogs were petted for 1 minute or were not petted. During each test, dog behaviour was measured by focal animal sampling and saliva collected 15 min after separation for cortisol determination.

The findings show that, during both procedures, dogs spent a long time seeking for the owner (median 84.5 and 87.5) and did not seem highly stressed by separation (low salivary cortisol levels and relatively low stress signals). When dogs were petted before separation displayed behaviours indicative of calmness for a longer period of time while waiting for the owner's return ($Z = -1.955$; $P = 0.049$), and their heart rate showed a marked decrease after the test ($Z = -1.682$; $P = 0.073$).

This pilot study suggests that petting a dog before a brief separation from the owner may have a positive effect, making the dog calmer during the separation itself. Further studies are needed to analyse more its effectiveness, especially in dogs affected by separation anxiety.

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Interest of cyproterone acetate in offensive social aggressions in dogs: 3 cases

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Conflicts of interest: none

Keywords: Dog, aggression, psychotropic treatments

Canine aggression remain one of the main reason for behavioural consultation and furthermore represents an important risk of euthanasia or abandonment¹. The classification of canine aggression has not reached any consensus across the scientific community. However, most dogs can improve with environmental changes, and behaviour modifications associated with medication.

The neurophysiology of aggression is still incompletely known, but several agents have been reported to play a role in its mechanisms: androgens, cortisol, and serotonin². This explains why selective serotonin reuptake inhibitors are commonly used as a pharmacological treatment. However, in severe cases, they may not completely manage aggressive behaviour and multiple medications may be required. That's why cyproterone acetate, a combined androgen antagonist and antigonadotrophin that has a weak glucocorticoid activity³, has been used.

We aim to present 3 cases of dogs exhibiting offensive social aggression despite their primary treatment. In each case, the addition of cyproterone acetate lead to a decrease in number and intensity of social aggressions; the aggressions resumed after its removal. In addition, selected cases included males and females, neutered or not, which suggest that cyproterone acetate can be useful in the treatment of offensive social aggressions in both genders, even neutered animals.

The main side effect reported is a mild increase in appetite, which could probably be more important without the primary medication (e.g. fluoxetine). Further studies including more cases are needed to investigate these preliminary findings assessing the efficacy and safety of cyproterone acetate in aggressive dogs.

REFERENCES

1. MARSTON, L.C., BENNETT, P.C., COLEMAN, G.J., 2004. What happens to shelter dogs? An analysis of data for 1 year from three Australian shelters. *J. Appl. Anim. Welf. Sci.* doi:10.1207/s15327604jaws0701_2
2. BATRINOS, M.L., L., M., 2012. Testosterone and aggressive behavior in man. *Int. J. Endocrinol. Metab.* 10, 563–568. doi:105812/ijem3661
3. LIEBERMAN, R., 2013. The androgen receptor, androgen synthesis, and new designer antiandrogens for metastatic castration-resistant prostate cancer: teaching old dogs new tricks. *American Journal of Therapeutics.*

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Long-term effect of high dose fluoxetine treatment on hypersensitivity-hyperactivity syndrome in dogs: a preliminary retrospective study

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Conflicts of interest: none

A canine version of attention deficit hyperactivity disorder called hypersensitivity-hyperactivity syndrome (HSHA) has been proposed by some authors^{1,2}. It includes two stages, depending on the severity. Since methylphenidate is not authorized for veterinary use in France, HSHA dogs are usually treated with high dose fluoxetine (2 to 4 mg/kg) associated with behavioural modification³. The aim of this retrospective study was to analyze the long-term effect of this protocol.

28 dogs diagnosed with HSHA were included. For each dog, 42 descriptive data were analyzed.

This affliction deeply alters the dog-human bond, as severe cases often lead owners to think about euthanasia or rehoming (10% for stage1; 77% for stage2).

78% of the dogs attended training classes before consulting, showed no noticeable improvement (mean score 1.7/10), and a lack of daily activity was not associated with the disorder severity (Kruskall-Wallis test, $p=0.5$). After a minimum of two months of fluoxetine (2 to 4 mg/kg/day), the average score of improvement given by owners was 7.2/10. No long-term adverse effects were reported.

An HSHA clinical score (0 to 5 scale) was constructed for statistical analysis. This score was positively correlated with treatment length

(Pearson correlation, $p<0.01$, $\rho=0.576$ 95%CI [0.225; 0.795]). A successful weaning from treatment was possible for half of the dogs.

These preliminary results suggest that long term administration of high daily dose fluoxetine was associated with behavioural modification. It appeared to be useful and well-tolerated to control boisterous dogs showing a wide range of clinical signs.

REFERENCES

1. PAGEAT, P., 1998. Pathologie du comportement du chien. Editions du point Vétérinaire, Maison-Alfort.
2. MEGE, C., BEATA, C., BEAUMONT-GRAFF, E., DIAZ, C., HARRAN, T., MARLOIS, N., MULLER, G., 2003. Pathologie comportementale du chien. Masson-AFVAC, Paris, FR.
3. BEATA, C., 2017. Hyperactivity-hypersensitivity syndrome and dissociative syndrome, resident study day, in: 11th International Veterinary Behaviour Meeting ESVCE- IVBM Samorin.

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Monitoring dog's daily activity level with a remote device in separation related disorders: a clinical report

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Conflict of interest: The authors declared none

Dog separation related disorders (SRD) are often associated with important complaints by owners, especially when presented with some undesirable behaviours (destructions, house-soiling and vocalisations)¹.

Describing dog behaviours during the owners' presence or absence is crucial in veterinary clinical ethology. Different studies have highlighted the importance of collecting social and non-social behaviours during the consultation². Moreover, video recording of the dog in its own home and on its own could really help to improve the diagnosis and prognosis³. Videos represent an important and effective tool to collect all possible behaviours associated with a dog's emotional reactions in different situations^{2,3}.

We have internally tested in SRD an electronic device, made to help clinicians looking for accurate changes in a dog's arousal and general daily activity, during therapies. As a practical example, Missa (Dobermann, EF, 2yo) showed separation anxiety with considerable destruction activity, house-soiling (day and night) and vocalisation, when home alone. Anxiety was correlated with pacing, flank sucking and also an increased ingestive behaviour (hyperphagia with pica, but without potomania). Missa's behaviour data were collected at home using videos and a wearable remote device to monitor and measure "rest", "active" and "play" behaviours. This device was put on the collar 24h/24h to compare daily activity data two weeks before (as baseline, waiting for blood examination results) and two weeks after the medical and behaviour therapy started.

The integration of a remote device made it much easier to describe a dog's anxiety levels when owners were leaving home, as well as describing behavioural modification in the animal's daily activities during therapy.

REFERENCES

1. NIWAKO OGATA. Separation anxiety in dogs: What progress has been made in our understanding of the most common behavioral problems in dogs? *Journal of Veterinary Behavior*, Volume 16, November–December 2016, Pages 28-35.
2. MENGOLI MANUEL, ROCCATI ROBERTA, COZZI ALESSANDRO, PAGEAT PATRICK, GAZZANO ANGELO, MARITI CHIARA. Analysing the behaviour of dogs affected and unaffected by separation anxiety during a behavioural consultation: preliminary results. *Proceedings of the 18th Annual Congress of the European Society of Veterinary Clinical Ethology - ESVCE*, 7-9 September 2012, Martigny (Switzerland).
3. SIMONA CANNAS, DIANE FRANK, MICHELA MINERO, ALESSANDRO ASPESIA, RICCARDO BENEDETTI, CLARA PALESTRINI. Video analysis of dogs suffering from anxiety when left home alone and treated with clomipramine. *Journal of Veterinary Behavior: Clinical Applications and Research*, Volume 9, Issue 2, March–April 2014, Pages 50-57.

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Effects of a Botanical Blend on Mild Car-Ride Induced Anxiety in Laboratory Dogs

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Conflict of interest: no conflict was declared by the authors

Keywords: travel, anxiety, dog, chamomile, ginger

Fear and anxiety during travel is a prevalent issue in dogs. Travel-related restlessness, excitability or nausea cause welfare concerns for the animal¹.
². Pet owners are seeking natural compounds as alternatives. Twenty Beagle dogs were included in a standardized route car ride study which employed a controlled, parallel matched-group design. Following baseline travel assessments, including heart rate (bpm), serum cortisol measures (nmol/L) and video-recorded behavioural observations (number of events), animals were allocated to one of two experimental groups. Eleven dogs were given the Test treatment of a proprietary blend (Vetdiet® Botanical Blend) of sweet orange essential oil, chamomile and ground ginger (3.4 mg/kcal) in the form of biscuits (12g/dog/day), while nine dogs received a Control treatment (Purina® Dog Chow®; 2g/dog/day), for 11 days prior to final travel assessment. A Linear Mixed Model with Tukey's test, was used to analyse the data ($P < 0.05$). The protocol was approved by the ACUC of Vivocore.

Serum cortisol increased in all dogs following car ride. Three minutes pre-car ride heart rate (mean:125.1, SEM:4.9) was significantly decreased from baseline (mean:142.1, SEM:4.7) in the Test group ($P < 0.05$) but not in the Control group. The frequency of lip licking observed in the Control group was significantly increased ($P < 0.01$) during treatment (mean:81.44, SEM:9.8) compared to baseline (mean:38.11, SEM:4.5), but was not increased in the Test group.

These findings suggest that a botanical blend of sweet orange essential oil, chamomile and ground ginger may be effective in reducing anxiety associated with anticipation of car transportation in dogs.

References

1. GANDIA ESTELLES M., MILLS D. (2006). Signs of travel-related problems in dogs and their response to treatment with dog-appeasing pheromone. *The Veterinary Record*, 159, pp.143-48.
2. WELLS D. (2006). Aromatherapy for travel-induced excitement in dogs. *Journal of the American Veterinary Medical Association*, 229 (6), pp. 964-967

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Feeding dogs from raised bowls – a pilot study

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Conflict of interest: The authors have no conflicts of interests to declare.

Keywords: dog, feeding, gastric dilatation-volvulus

Feeding dogs from raised bowls (FRB) has been cited among the factors influencing the risk of gastric dilatation-volvulus (GDV) (1). We aimed at investigating owner stated reasons for FRB. A convenience sample was recruited via social media and online filled-in questionnaires concerning 716 dogs were collected (mean age=5.3 years, SD=3.57 years, mean weight=19.4 Kg, SD=12.22 kg).

One-hundred and eighty-one owners declared FRB (25.3%), 38 of which were following veterinary advice. Thirty-one mentioned prevention of GDV as the reason for their choice (12 having been advised on the topic by vets), and 33 other advantages that were linked to easier swallowing or digestion, and 47 advantages linked to a better posture while eating, which caused less strain on the muscle-skeletal apparatus and/or was supposedly more comfortable for the dog. Only seven had actually observed their dog while eating both from a raised and from a non-raised bowl and deemed the dog was happier/more comfortable eating from the former. Dogs fed from raised bowls were higher at the withers than dogs fed from non-raised bowls (Mann Whitey U test, $p < 0.001$). There was no difference in the prevalence of general health problems (Yates-corrected chi-square $p = 0.353$), or in gastrointestinal (Fisher exact test, $p = 0.417$), muscle-skeletal (Yates-corrected chi-square, $p = 0.779$) and behavioural (Yates-corrected chi-square $p = 0.163$) problems between dogs fed from raised bowls and dogs fed from non-raised bowls.

In conclusion, more research is needed on the effects of FRB in order to

correctly advise owners on the possible prevention of health and welfare affecting conditions such as GDV.

REFERENCE

1. HAND M.S., THATCHER C.D., REMILLARD R.L., ROUDEBUSH P., NOVOTNY B.J. 2010. Small Animal Clinical Nutrition, 5th Edition, Mark Morris Institute, Topeka, USA.

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Effects of human-animal interaction and isolation on salivary oxytocin in 8 guide dogs

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Conflict of interest: The Authors declared that there was none.
Keywords: Oxytocin, Salivary, Dog, Isolation, Interaction.

Recent studies suggest that oxytocin facilitates and increases after affiliative, positive forms of human-animal interaction, including domestic dogs. However, the possible role of oxytocin in stressful situations has not yet been well investigated.

From a neurophysiological point of view, secretion of oxytocin is an inherent feature of HPA axis regulation. In response to a stressor, oxytocin is released in the PVN, which is subsequently associated with active stress-coping behaviour (1). This mechanism seems also to occur in humans. In fact, a study on the link between romantic attachment anxiety and levels of plasma oxytocin supports the hypothesis that oxytocin levels may rise in response to relationship anxiety (2) and another study found higher levels of oxytocin after a stressful interpersonal task were associated with more anxiety, suggesting that oxytocin could be a marker for distress (3). Furthermore, oxytocin levels would seem to be positively correlated with increased maternal separation distress (4).

In view of these hypotheses, this preliminary study aimed to investigate the possible correlation between oxytocin and isolation distress in dogs. The study included 8 guide dogs (6 Labrador Retrievers and 2 Golden Retrievers, 4 males and 4 females, mean age = 21.87 ± 1.36 months) just before assignment. Each dog engaged, with one-week intervals, in a positive (5 minutes of affiliative interaction with their trainer) and a negative (5 minutes of isolation) condition. Each condition was randomly selected and took place in two different rooms and before each condition the dogs had

one minute to explore the environment with their trainers. The rooms were almost identical: same square footage and same layout.

Saliva samples were collected before and immediately after both experimental conditions. All samples were used for EIA quantification of oxytocin (5). The results were compared using the Wilcoxon test ($p < 0.05$).

Oxytocin concentrations showed a statistically significant increase after the positive interaction (before versus after: median 172.77 versus 193.77 pg/mL, min-max 117.97-282.23 versus 135.80-433.11 pg/mL; $Z = -2.100$; $p = 0.036$) and no difference after the negative one (193.97 versus 211.35 pg/mL, 111.10-372.10 versus 105.30-374.10 pg/mL; $Z = -0.280$; $p = 0.779$).

Contrary to what has been observed in lambs (6), these preliminary findings confirm that salivary oxytocin is correlated with a positive human-animal interaction in dogs, whilst it seems not to be influenced by negative ones. However, such lack of difference may be due to the fact that guide dogs are used to being left alone and, consequently, that the isolation distress level was not enough to cause a significant variation in salivary oxytocin levels. Further studies, that analyse dog behaviour, assess cortisol levels and maybe oxytocin receptor gene polymorphism, are required to evaluate the possible correlation between oxytocin and distress.

REFERENCES

1. BUTTNER, A.P., 2016. Neurobiological underpinnings of dogs' human-like social competence: how interactions between stress response systems and oxytocin mediate dogs' social skills. *Neuroscience & Biobehavioral Reviews*, 71, pp.198-214.
2. MARAZZITI, D., DELL'OSSO, B., BARONI, S., MUNGAI, F., CATENA, M., RUCCI, P., ALBANESE, F., GIANNACCINI, G., BETTI, L., FABBRINI, L. AND ITALIANI, P., 2006. A relationship between oxytocin and anxiety of romantic attachment. *Clinical Practice and Epidemiology in Mental Health*, 2(1), p.28.
3. TABAK, B.A., MCCULLOUGH, M.E., SZETO, A., MENDEZ, A.J. AND MCCABE, P.M., 2011. Oxytocin indexes relational distress following interpersonal harms in women. *Psychoneuroendocrinology*, 36(1), pp.115-122.

4. TORRES, N., MARTINS, D., SANTOS, A.J., PRATA, D. AND VERÍSSIMO, M., 2018. How do hypothalamic nonapeptides shape youth's sociality? A systematic review on oxytocin, vasopressin and human socio-emotional development. *Neuroscience & Biobehavioral Reviews*.
5. MACLEAN, E.L., GESQUIERE, L.R., GEE, N., LEVY, K., MARTIN, W.L. AND CARTER, C.S., 2018. Validation of salivary oxytocin and vasopressin as biomarkers in domestic dogs. *Journal of neuroscience methods*, 293, pp.67-76.
6. COULON, M., NOWAK, R., ANDANSON, S., RAVEL, C., MARNET, P.G., BOISSY, A. AND BOIVIN, X., 2013. Human–lamb bonding: Oxytocin, cortisol and behavioural responses of lambs to human contacts and social separation. *Psychoneuroendocrinology*, 38(4), pp.499-508.

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Influence of gonadectomy on canine behaviour

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Conflict of interest: The authors declared there was none.

Keywords: Dog, gonadectomy, behaviour

In veterinary practice, surgical sterilization of dogs is one of the most common surgical procedures performed. It has been considered for decades to be a routine standard for the prevention of numerous undesirable behaviours, medical conditions, and diseases. This study aims to evaluate the effects of gonadectomy on dogs' behaviour over time.

The study was carried out on 156 clinically healthy dogs (78 control group and 78 experimental group balanced for gender). Dogs' owners were asked to complete an initial questionnaire (time 0). Follow-up questionnaires, that included dog's demographic information and behavioural history, as well as information on the dog's physical and social environment, were sent at 10 days, 1, 3, 6 and 9 months after the first examination.

Answers to the questionnaires showed that there was no change between time 0 and 9 months in both groups of dogs for eating and drinking behaviours, exploration, grooming, chewing objects, destruction, excessive barking, pica and coprophagy. In addition, no difference was found for inappropriate elimination in the house or repetitive behaviours. In the experimental group sleeping behaviour increased significantly ($p \leq 0,05$) over time, while no change was observed in the controls. Owner aggression, pulling on a leash, roaming behaviours decreased significantly in the experimental dogs between time 0 and 9 months ($p \leq 0,05$), and only

a tendency to a difference was detected for inter-dog aggression.

Our study diverges with some previous findings. More research is needed to contribute to the debate regarding whether and how gonadectomy can affect canine behaviour.

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Automatic identification of separation anxiety-related behaviours in family dogs (*Canis familiaris*) in controlled laboratory setting

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Conflicts of interest: The authors declare that there are none
Keywords: dogs, separation anxiety, family dogs

Separation related disorders (SRD) represent approximately 20% of cases referred to dog behaviour specialists (1). However, performing a proper diagnosis is difficult because SRD typically happens in the owner's absence, when it is difficult to measure the dog's behaviour accurately (2) as well as other behaviour problems (e.g. noise reactive barking), which might cause similar signs.

The aim of this study was to assess the applicability of a behaviour tracker (i.e. an automatic behaviour identification system consisting of motion sensors, such as accelerometer and gyroscope, and associated software application) in diagnosing dogs with SRD.

In controlled laboratory settings, we tested two groups of adult family dogs with and without SRD (n=20/group, different breeds, both sexes). We ran a short separation test from the owner, in which we recorded dogs'

behaviour before the owner's departure, during the owner's absence and return (greeting behaviour) by means of video cameras and a collar-worn motion sensor device in parallel.

Our results are in line with our hypothesis that dogs with SRD can be automatically differentiated from dogs without SRD based on their behavioural characteristics measured by the tracker device in the owner's absence.

To conclude, an automatic sensor device offers a good solution to remotely collect reliable and objective behavioural data from dogs thus contributing to the diagnosis of SRD. It also saves effort and time by increasing the likelihood of a quick and accurate diagnosis of this disorder, and to a consequential successful treatment outcome.

REFERENCES

1. LANDSBERG, G.M; HUNTHAUSEN, W; ACKERMAN, L 2013. Fear, phobias, and anxiety disorders. In: Landsberg G.M; Hunthausen,W; Ackerman, L (Eds) Behavior Problems of the Dog and cat , 3rd ed. Elsevier Saunders, Philadelphia, USA pp 181-210
2. GAULTIER, E., BONNAFOUS, L., BOUGRAT, L., LAFONT, C., & PAGEAT, P. (2005). Comparison of the efficacy of a synthetic dog-appeasing pheromone with clomipramine for the treatment of separation-related disorders in dogs. *Veterinary Record-English Edition*, 156(17), 533-537.
3. GERENCSEI,L; VASAERHELYI,G; NAGY,M; VICSEK,T; MIK-LOSI,Á; 2013. Identification of behaviour in freely moving dogs (*Canis familiaris*) using inertial sensors. *PLOS ONE*, 8 (10): e77814

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Habituation effects on food choice in dogs – implications for training

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Conflicts of interest: The authors declare none. The research was funded by the University of Bern.

Keywords: domestic dog *Canis familiaris*, food reward, reinforcement, motivation, variety effect

INTRODUCTION

Although food is commonly used in animal training, how to use food rewards effectively has rarely been investigated (but see ¹). By definition, rewards function as re-inforcers if they increase or maintain the frequency of behaviour that they follow. However, often performance in operant tasks decreases over time. Providing a variety of food rewards, rather than the same reward in all trials, may counteract such decreases. This phenomenon is referred to as 'variety effect'. Here we explored whether dogs prefer varied or constant rewards given the choice.

METHODS

We tested 16 dogs in a two-choice test. During six blocks of ten trials, dogs could select either a constant option (their favoured food according to a preference test) or a varied option (semi-random presentation of three different foods including their preferred food).

RESULTS AND DISCUSSION

Binomial tests indicated that six subjects significantly preferred the constant reinforcement option and six the varied reinforcement option. Four dogs exhibited no significant preference for either condition (which could also be viewed as a preference for varied reward). At the group level, there was no significant preference for either option (one sample t-test: $t_{14} = -0.071$, $p = 0.944$); however, there was a significant effect of block (linear model: $F_{1,73} = 6.278$, $p = 0.014$). In almost all subjects, preference for the varied reinforcement increased as the blocks progressed, in line with habituation to the constant reward type.

CONCLUSION

Although some individuals may prefer a single, favourite reward in the short term, introducing variation in food rewards may maintain dogs' motivation over a longer time period².

REFERENCES

1. RIEMER, S., ELLIS, S.L., THOMPSON, H. AND BURMAN, O.H., 2018. Reinforcer effectiveness in dogs — The influence of quantity and quality. *Applied Animal Behaviour Science*, in press. doi.org/10.1016/j.applanim.2018.05.016
2. BREMHORST, A., BÜTLER S., WÜRBEL, H., RIEMER, S., 2018. Incentive motivation in pet dogs – preference for constant vs varied food rewards. *Scientific Reports*, accepted manuscript.

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Cat exercise wheel – a new therapeutic tool for cats?

S. Schroll

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Keywords: cats, indoor cats, running wheels, exercise, overweight animals

Even though cats are not overtly running animals and hunters, they are likely to need physical exercise, and this need is greatly underestimated in indoor cats. Typically, cats have short bursts of activity – running and jumping, but they also wander around for some distances when hunting or checking the territory. Some of the physical and behavioural problems of cats kept only indoors are seen daily in behavioural practices and this condition may be connected with a lack of exercise, frustration and dissatisfaction with the environment. Cat wheels have been used for a long time, especially by owners and breeders of Bengal cats, as this breed is very active. There are no data or publications about the indications and therapeutic effects of exercise wheels or potential side effects, e.g. possible development of stereotypies or orthopaedic problems. Such problems are sometimes discussed on the Internet, but there are no studies documenting this concern. In this presentation the use of exercise wheels in therapy will be discussed. Normal and high speed videos will show the introduction, movement and possible stress points, as well as contexts and indications for potential therapeutic use will be discussed.

As overweight and obesity have reached epidemic proportions in cats, its treatment and dietetic management and the need for behaviour modification in which more exercise forms an essential part, is required. Data from daily life like examples for average and maximum speed, distances and frequencies of running in the wheel will be presented.

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Quick Guide Kitten Kindergarten – practical implementation of a new concept

S. Schroll

Conflicts of interest: the author declared there were none
Keywords: cat, kitten, early training, preventing behaviour problems

There is no doubt that the concept of an intensified early socialisation for kittens – as proposed by Kersti Seksel's Kitty Kindy (1) – is an important tool to improve life for cats as well as their owners. While the implementation in daily practice is not easy – time, a safe room for kittens and experienced personnel are restrictions to make the kitten kindergarten an integrated part in every veterinary practice. The recommendation to take a maximum of 4 kittens a time, and not even all kittens compatible for group sessions, makes it even more cost/time inefficient and, therefore unfortunately, rather unrealistic. But - kittens learn quickly and current vaccine recommendations brings them into the practice at least 3 times (or optional 5 times until puberty). Therefore during these visits it is possible to start with snippets of 5-15 additional minutes as a quick guide kindergarten.

The proposed programme for this quick guide kindergarten is a combination of demonstration and hands-on handling of the kitten, a short educational chat about feline needs, and some homework until the next visit. This plan has been developed over 3 years, and it is possible for every practice that sees cats, to implement a basic, individualised yet somehow standardised kitten socialisation and education programme.

REFERENCES

1. SEKSEL, K., Preventing Behavior Problems in Puppies and Kittens. (2008) Vet Clin Small Anim 38 971–982.

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Development of a novel laboratory model reproducing everyday mild stressors in fearful dogs

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Conflicts of interest: the authors declared there were none

Keywords: dogs, mild stress model

Fear and anxiety are common reasons for consultations in veterinary medicine. Therefore numerous medications have been developed and tested with different laboratory models using kennelled beagles. Some induce fear with an unfamiliar human (1, 2), or a thunderstorm recording (3, 4).

This study describes a model using pet dogs facing everyday life stressors. 39 pet dogs of diverse breeds aged between 1 and 6 years were recruited in the waiting room of ENVA (Ecole Nationale Vétérinaire d'Alfort) or via the internet and selected after a short questionnaire derived from C-BARQ. Each dog was scored to provide a baseline. The animals were then submitted to series of behavioural tests representing everyday life situations. The test was divided in four subtests. Behaviours were recorded during these tests and salivary cortisol was measured before and after each test.

We compared cortisol values before and after the behavioural tests. Cortisol values tended to be higher after the test (Mann-Whitney, $F(df)=30$, $p=0,084$). Then dogs with scores from 6 to 9 ("more fearful") were compared to dogs with scores from 1 to 5 ("less fearful"). The "more fearful" dogs showed higher cortisol values after the test (Mann-Whitney $p=0,013$; $F(df)=30$) and more stress-related behaviours during the test: lower activity (Mann-Whitney $p=0,007$; $F(df)=38$), higher time spent in the door zone (Mann-Whitney, $p=0,023$; $F(df)=38$), less time playing (Mann-Whitney, $p=0,046$; $F(df)=38$), and fewer new object approaches (Mann-

Whitney, $p=0,047$, $F(df)=38$).

We conclude that a C-BARQ modified questionnaire associated with the described tests could provide a useful laboratory model to test therapeutic strategies and substances used to decrease fear or anxiety in everyday life situations.

REFERENCES

1. ARAUJO, J., DE RIVERA C., ETHIER, J., LANDSBERG, G., DENENBERG, G., ARNOLD, S., MILGRAM, N. (2010). Anxitane® tablets reduce fear of human beings in a laboratory model of anxiety-related behavior. *Journal of veterinary behavior*, 5(5), pp. 268-275.
2. PALESTRINI, C., MINERO, M., CAMAS, S., BERTESELLI, G., SCAGLIA, E., BARBIERI, S., CAVALLONE, E., PURICELLI, M., SERVIDA, F., DALL'ARA, P. (2010). Efficacy of a diet containing caseinate hydrolysate on signs of stress in dogs. *Journal of veterinary behavior*(5), pp 309-317.
3. ARAUJO, F., DE RIVERA, C., LANDSBERG, G., ADAMS, P., MILGRAM, N. (2013). Development and validation of a novel laboratory model of sound-induced fear and anxiety in Beagle dogs, *Journal of veterinary behavior* (8), pp 204-212.
4. LANDSBERG, G., MOUGEOT, I., KELLY, S., MILGRAM, N. (2015). Assessment of noise-induced fear and anxiety in dogs: Modifications by a novel fish hydrolysate supplemented diet. *Journal of veterinary behavior*. (10), pp 391-398.

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Comparison of clomipramine and fluoxetine treatment in dogs with tail chasing

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Keywords: Dog, tail chasing, clomipramine, fluoxetine

INTRODUCTION

The aim of the study was to determine the response to treatment with clomipramine and fluoxetine in dogs with tail chasing.

METHODOLOGY

Twenty-five client-owned dogs with tail chasing were included in this study. Diagnosis of tail chasing was made on the basis of the dog's behavioural history, clinical signs, and results of laboratory measurements. The study had a randomized, placebo-controlled, double-blind design. Dogs were allocated to three groups. Dogs in one group were given 2mg/kg clomipramine hydrochloride orally for 12 weeks; dogs in a second group received 1mg/kg fluoxetine orally for 12 weeks; and a placebo was administered to control dogs. Changes in signs of tail chasing were reported weekly by the owners. Treatment was assessed at four intervals: weeks 1-3, 4-6, 7-9, and 10-12 weeks.

RESULTS

German shepherd dogs and Anatolian sheepdogs were overrepresented. At all four intervals improvement of tail chasing did not differ significantly between clomipramine and fluoxetine ($p > 0.05$). Improvement of behaviour in the clomipramine group was significantly better than in the placebo group between weeks 1-3 and 4-6 and between weeks 7-9 and 10-12 ($p < 0.05$). Furthermore, there was a significantly improvement in the fluoxetine group between weeks 7-9 and weeks 10-12 compared with the placebo group ($p < 0.05$).

CONCLUSION

Clomipramine and fluoxetine seem to be equally effective in the treatment of tail chasing. Treated dogs responded well to the drugs.

REFERENCES

1. IRIMAJIRI M, LUESCHER AU, DOUGLASS G, ROBERTSON-PLOUCH C, ZIMMERMANN A, HOZAK R. Randomized, controlled clinical trial of the efficacy of fluoxetine for treatment of compulsive disorders in dogs. *J Am Vet Med Assoc* 2009; 235(6): 705–709.
2. REISNER IR. Diagnosis of canine generalized anxiety disorder and its management with behavioral modification and fluoxetine or paroxetine: A retrospective summary of clinical experience (2001–2003). *J Am Hosp Assoc* 2003; 39: 512.
3. SEKSEL K, LINDEMAN MJ. Use of clomipramine treatment of anxiety-related and obsessive-compulsive disorders in cats. *Aust Vet J* 1998; 76 (5): 317–321.
4. HEWSON CJ, LUESCHER A, PARENT JM, CONLON PD, BALL RO. Efficacy of clomipramine in the treatment of canine compulsive disorder. *J Am Vet Med Assoc* 1998; 213 (12): 1760–1766.

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Use of fluoxetine to treat stereotypical pacing behaviour in a brown bear (*Ursus arctos*)

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Conflicts of interest: The authors declared there was none and declared that this study has received no financial support. This article is published in Journal of Veterinary Behavior: Clinical Applications and Research

Keywords: Stereotypic, behaviour, brown bear (*Ursus arctos*), fluoxetine

INTRODUCTION

A stereotypy is an intentional repetitive behaviour, non-functional, non-injurious, highly predictable sequencing of actions, often carried out in a specific and rhythmic manner. Captive bears seem to be particularly susceptible to stereotypies. Stereotypic pacing is the rhythmic walking to one side of an enclosure, the flip of the head while turning and then walking back to the other side, before repeating the turn.

METHODOLOGY

A 12-year-old, male, brown bear (*Ursus arctos*) named Abdi exhibited stereotypical pacing behaviour. He had been kept as a pet for 10 years by local villagers. He was then rescued and taken to the Karacabey Bear Sanctuary in July 2001. His physical condition was extremely poor. Because he had never lived with other bears, he was terrified and refused to integrate with them. After 6 months he was healthy physically but observations by the keepers indicated that he was pacing all day. He was treated

with fluoxetine (0.62 mg/kg orally every 24 hours) for 6 months, and had been observed for a total of 18 months.

MAIN RESULTS

The stereotypical behaviour ceased completely. He was then transferred to the large naturalistic enclosure and did not show any stereotypical behaviour during the subsequent observation period of 1 year.

CONCLUSION

Brown bears with this type of stereotypy can be treated successfully with fluoxetine. Additionally, it may be useful to provide extra space, and novel stimulation in a natural enclosure. The space and stimulation could be sufficient to mimic the therapeutic effect of the pharmacological therapy in the long term.

REFERENCES

1. POULSEN, E.M.B., HONEYMAN, V., VALENTINE, P.A., TESKEY, G.C., 1996. Use of fluoxetine for the treatment of stereotypical pacing behavior in a captive polar bear. *J. Am. Vet. Med. Assoc.* 209, 1470-1474.
2. WECHSLER, B., 1991. Stereotypies in polar bears. *Zoo. Biol.* 10, 177-188.
3. LANGENHORST, T., 1998. Effects of a behavioral enrichment program on the stereotypic behavior of brown bears (*Ursus arctos*) [in German]. *Zool. Garten N. F.* 68, 341-354.

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